PIONEER

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS

STEREO TURNTABLE

PL-X7

MODEL PL-X7 COMES IN FOUR VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
HE	220V and 240V (Switchable)	Europe model
HB	220V and 240V (Switchable)	U.K. model
S	110V, 120V, 220V, 240V (Switchable)	General export model
S/G	110V, 120V, 220V, 240V (Switchable)	U.S. military model

- **This is the service manual for model PL-X7/HE, HB and S. For servicing of S/G type, please refer to the additional service manual.**
- **The operational description for the PL-X7 is basically the same as for the PL-X50 so refer to the PL-X50 service manual (ART-698).**
- **Ce manuel d'instruction se refère au mode de réglage, en français.**
- **Este manual de servicio trata del método de ajuste escrito en español.**

CONTENTS

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PIONEER ELECTRONICS (USA) INC. 1925 E. Dominguez St., Long Beach, California 90810 U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia

1.SPECIFICATIONS

Motor and Turntable

Drive System ..... Belt-drive
Motor ..... DC motor
Turntable Platter ..... 180 mm diam. aluminum alloy die-cast
Speeds ..... 33-1/3 and 45 rpm
Wow and Flutter ..... Less than 0.045% (WRMS) ±0.065% WTD Peak (DIN)
Signal-to-Noise Ratio ..... More than 70 dB (DIN-B) (with Pioneer cartridge model PC-31MC)

Tonearm

Type ..... Integrated straight pipe arm

PC-31MC Specifications

Type ..... Moving coil type
Stylus ..... 0.5 mil diamond (PN-31MC)
Output Voltage ..... 2.5 mV (1kHz, 5cm/s LAT, Peak)
Tracking Force ..... 1.7 g to 2.3 g (proper 2 g)
Frequency Response ..... 10 to 32,000 Hz
Recommended Load ..... 50 kΩ

Subfunctions

Full auto functions based on a motor specially designed for the tonearm
Auto disc size selector (17 cm, 30 cm)
Arm elevation mechanism
Built-in anti-skating

Miscellaneous

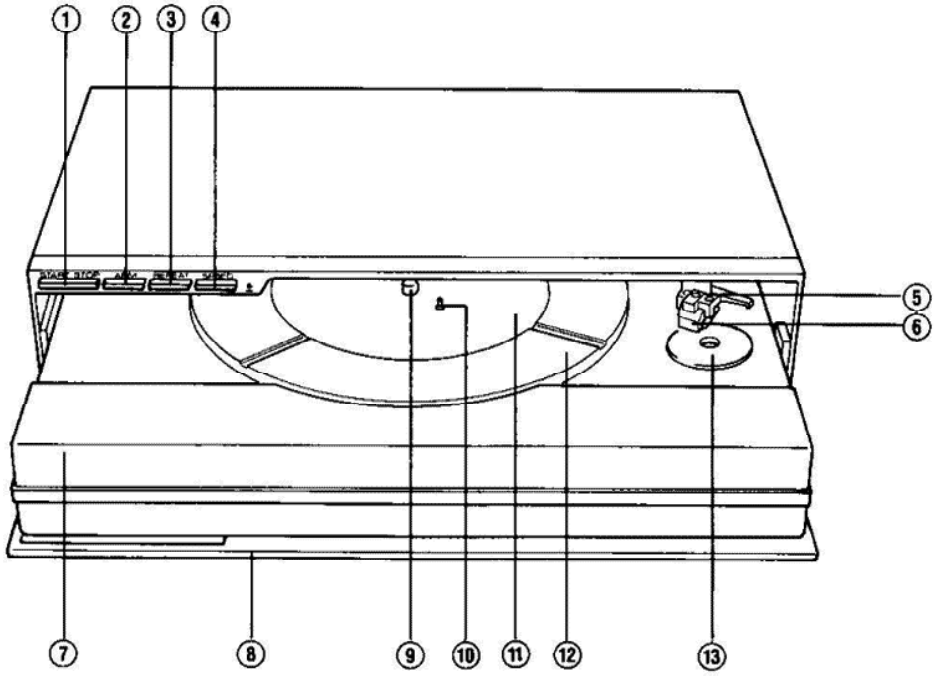
Power Requirements ..... AC 220/240V (switchable), 50, 60 Hz
Power Consumption ..... 9 W
Dimensions ..... 320 (W) x 98 (H) x 210 (D) mm 12-5/8 (W) x 4-1/4 (H) x 8-1/4 (D) in.
Weight ..... 5.5 kg/12 lb 2 oz

Accessories

EP Adapter 1
Operating Instructions 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

2.FRONT PANEL FACILITIES



① START/STOP SWITCH

Press this to start or stop record play.

② ARM ELEVATION SWITCH

- Use the switch to manual play.
- Use the switch to suspend record play temporarily.
- Use the switch when changing the tracks during actual play.

[▼] (depressed position):
The tonearm rises (the stylus moves away from the record).
[▼] (released position):
The tonearm descends (the stylus is lowered onto the record).

③ REPEAT SWITCH

Set this switch for repeat play.

④ SPEED SWITCH

Set this switch in accordance with the speed of the record which is to be played.
[33] (released position): For 33-1/3 rpm record.
[45] (depressed position): For 45 rpm record.

⑤ HEADSHELL, TONEARM

⑥ CARTRIDGE (PC-31MC)

⑦ SLIDE BASE

⑧ DOOR

⑨ PLATTER SHAFT

⑩ RECORD SENSING PIN

This pin checks that a record is actually on the platter.

⑪ PLATTER

⑫ RUBBER MAT

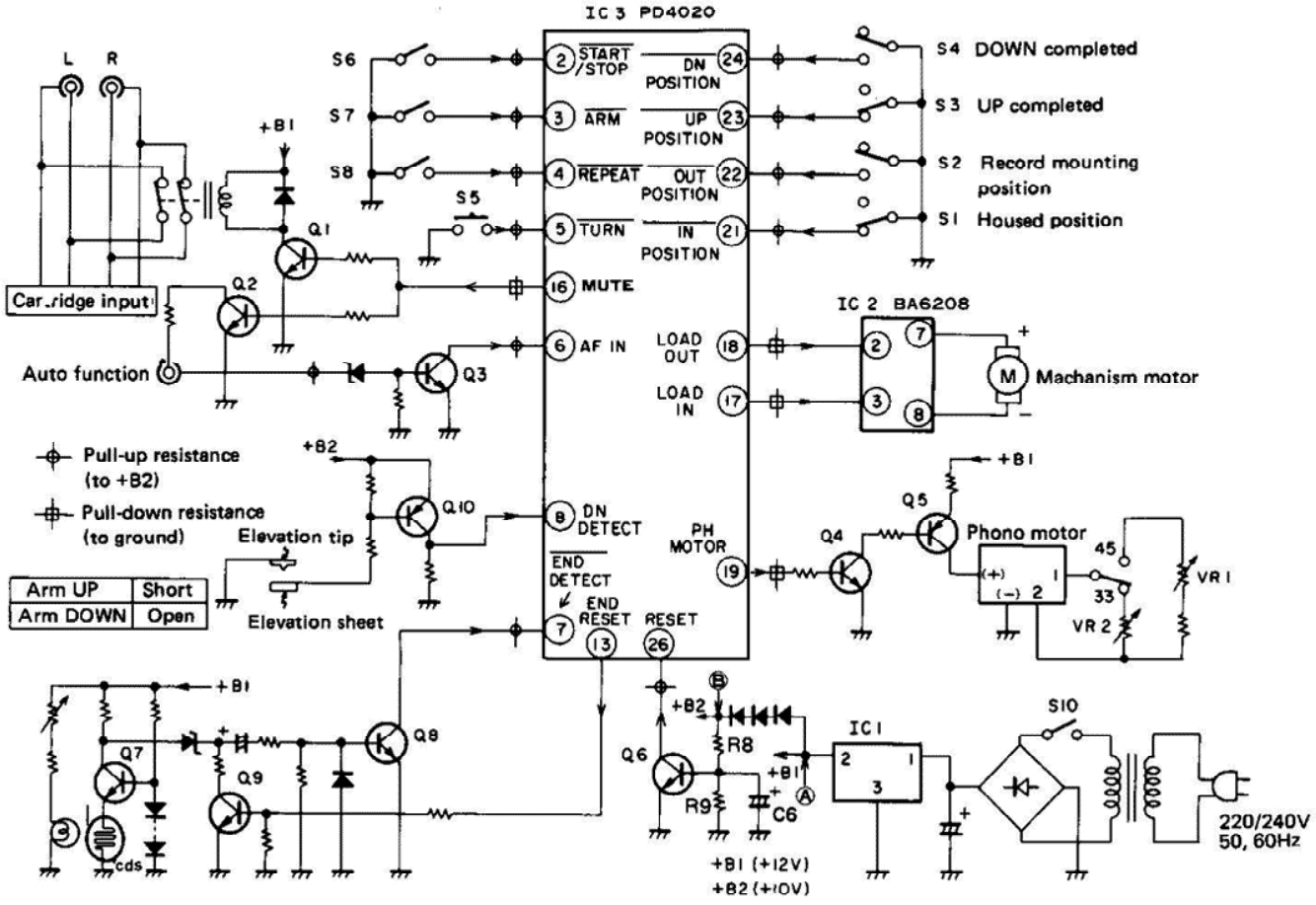
NOTE:
Always use the rubber mat which is supplied as an accessory with this unit. Using any other mat will cause the stylus tip height to change and may result in malfunctioning.

⑬ EP ADAPTER/ADAPTER HOLDER

Slide the EP adapter over the platter shaft when the record you want to play does not have a "middle." Keep the adapter on the holder when it is not in use.

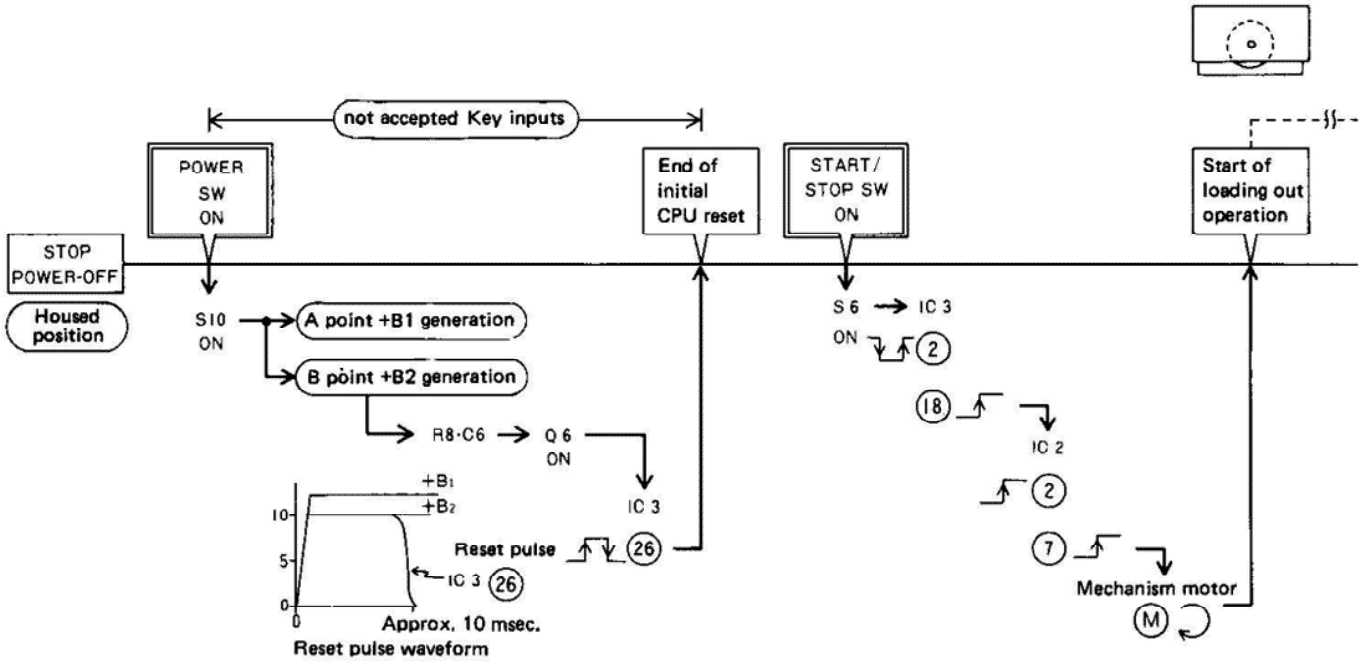
NOTE:
Make sure that you use the EP adapter which is supplied with this unit. Using any other adapter may invite contact with the stylus, with the result that the stylus may be damaged.

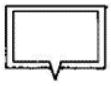
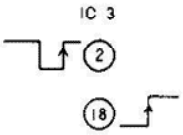
3.BLOCK DIAGRAM

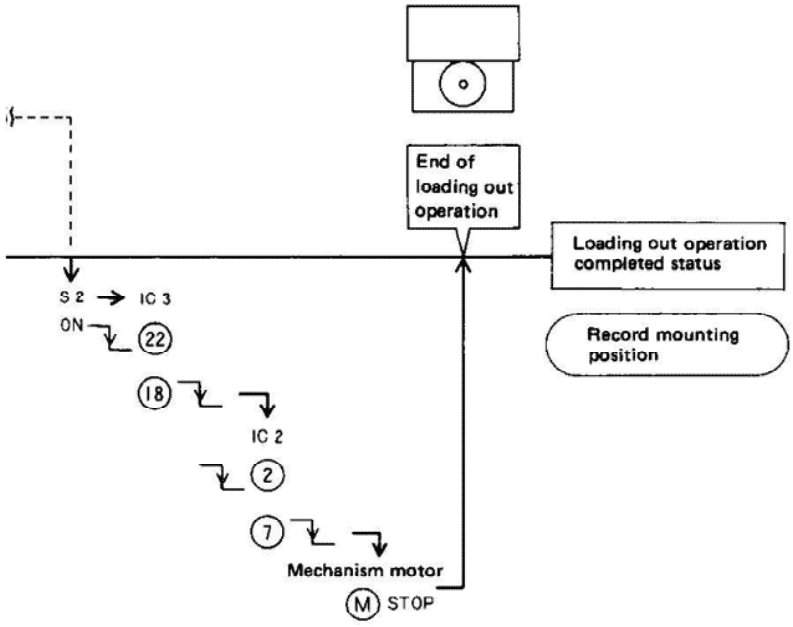


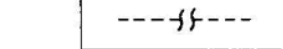
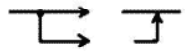
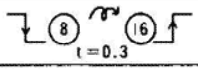
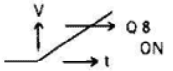
4.CIRCUIT DESCRIPTIONS

2.1 LOADING OUT OPERATION

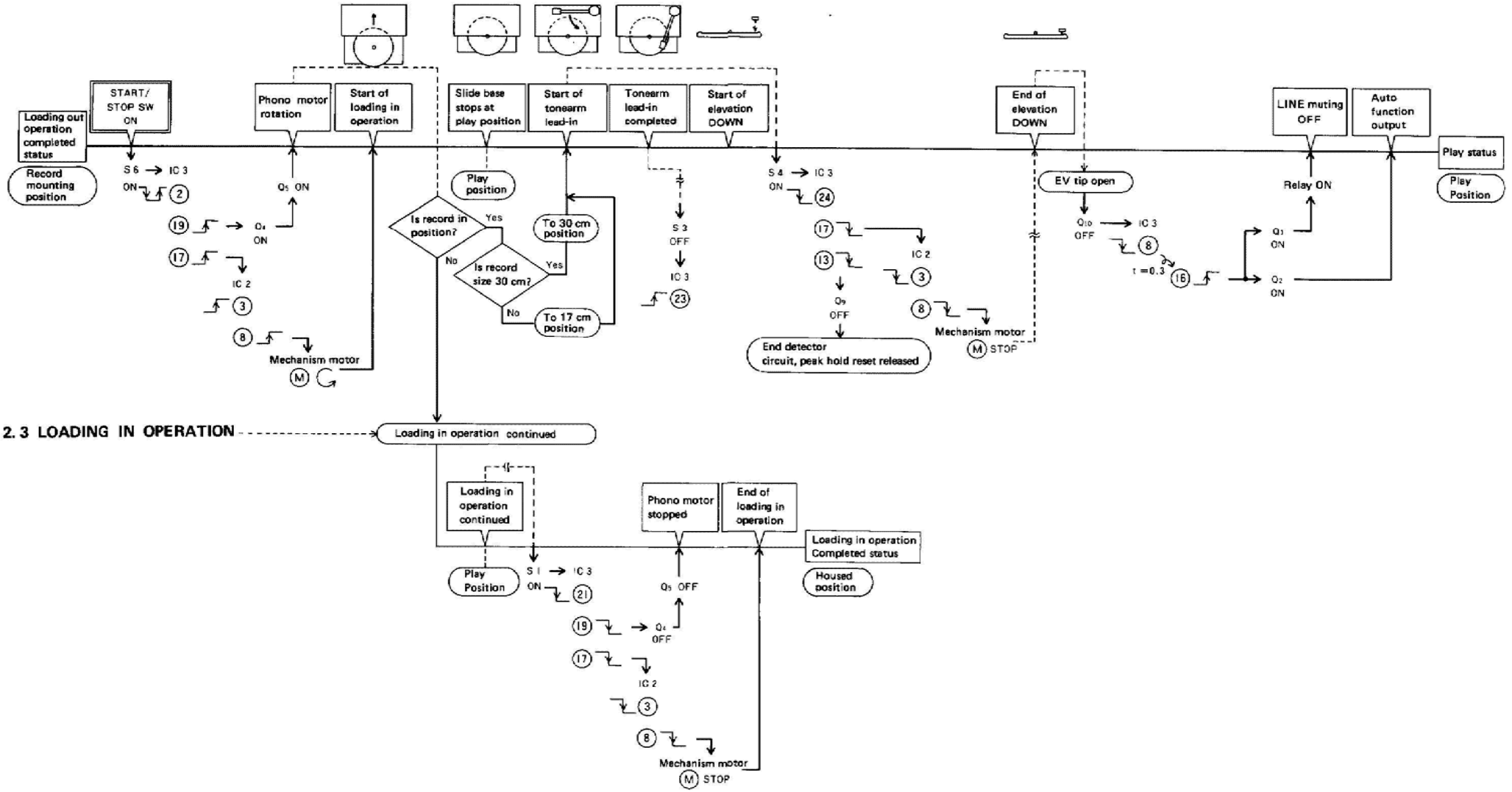


Symbol	Symbol Meaning
	• Manual operation
	• Points of specific operation or status
	• Status at start or end of operation
	• Level switched from L to H
	• Level switched from H to L
	• Pulse signal applied to pin (2) of IC3, and pin (18) switched from L to H level.

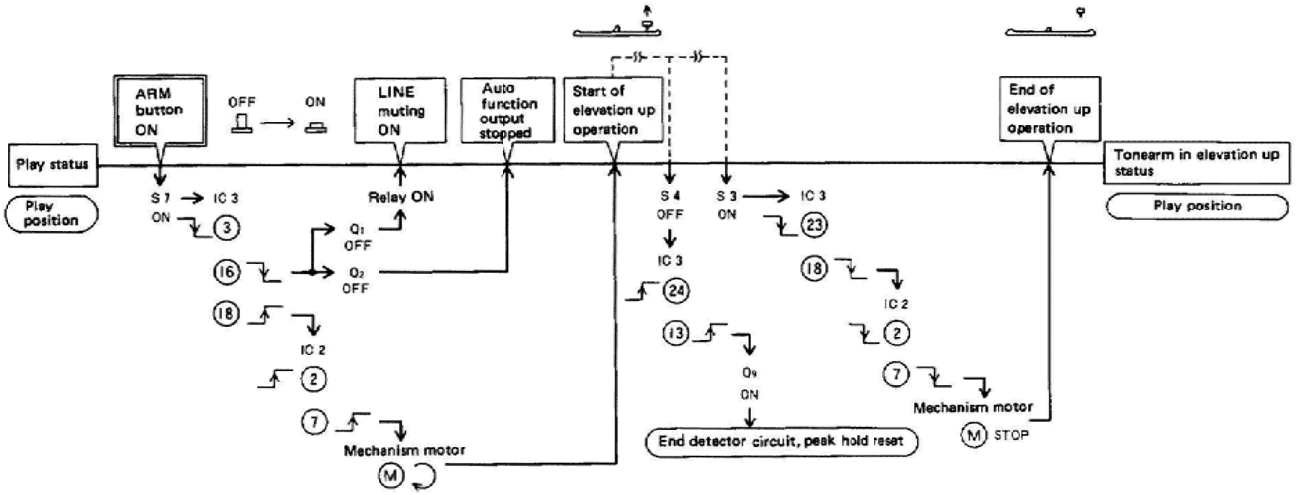


Symbol	Symbol Meaning
	• Denotes passage of time
	• Branching and mixing
	• Pin 16 switched to H level t seconds after pin 8 is switched to L level.
	• Q8 turned ON when steadily increased voltage reaches a specific level (indicated by arrow intersection).

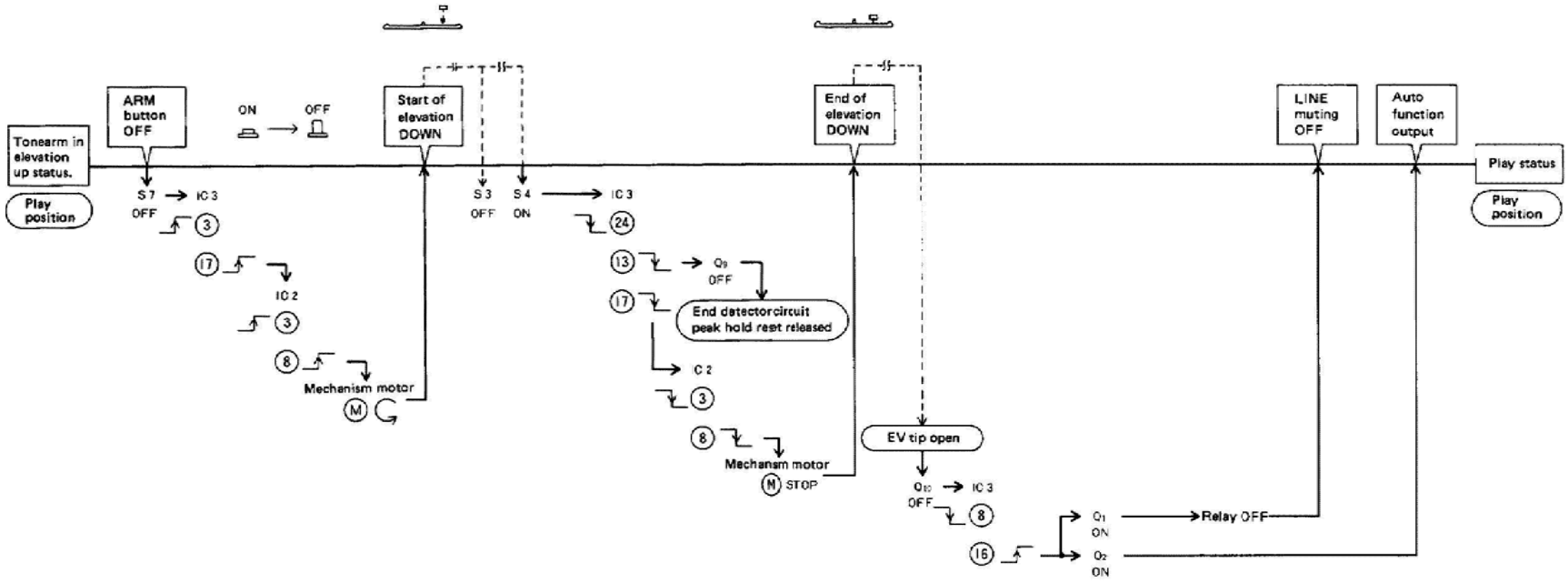
2. 2 AUTO LEAD-IN OPERATION



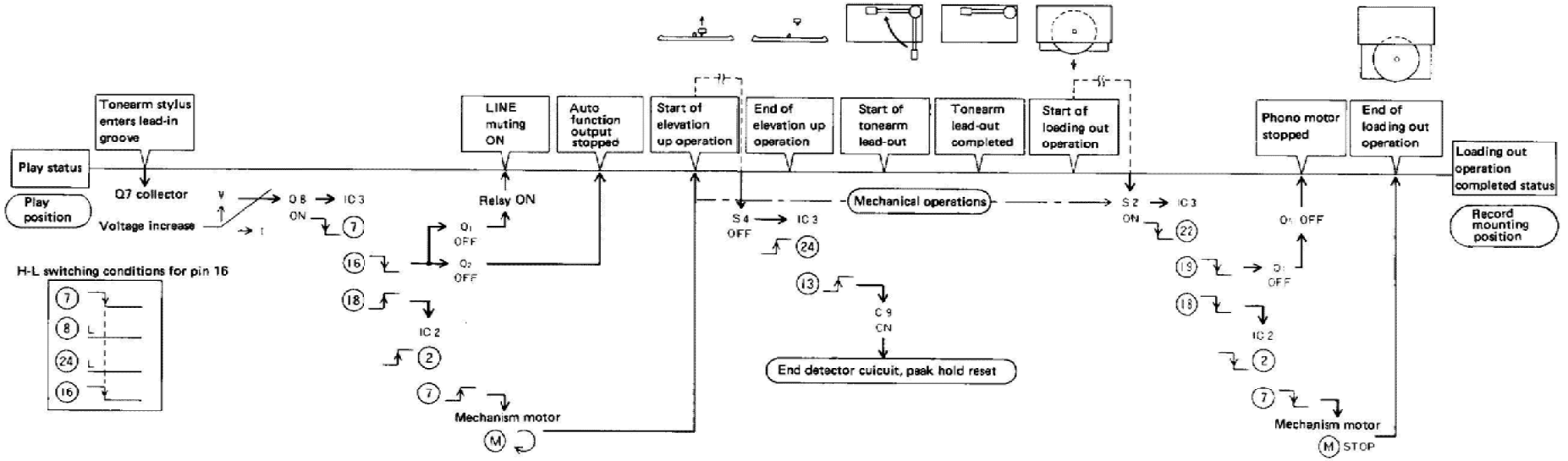
2.4 ARM ELEVATION UP OPERATION



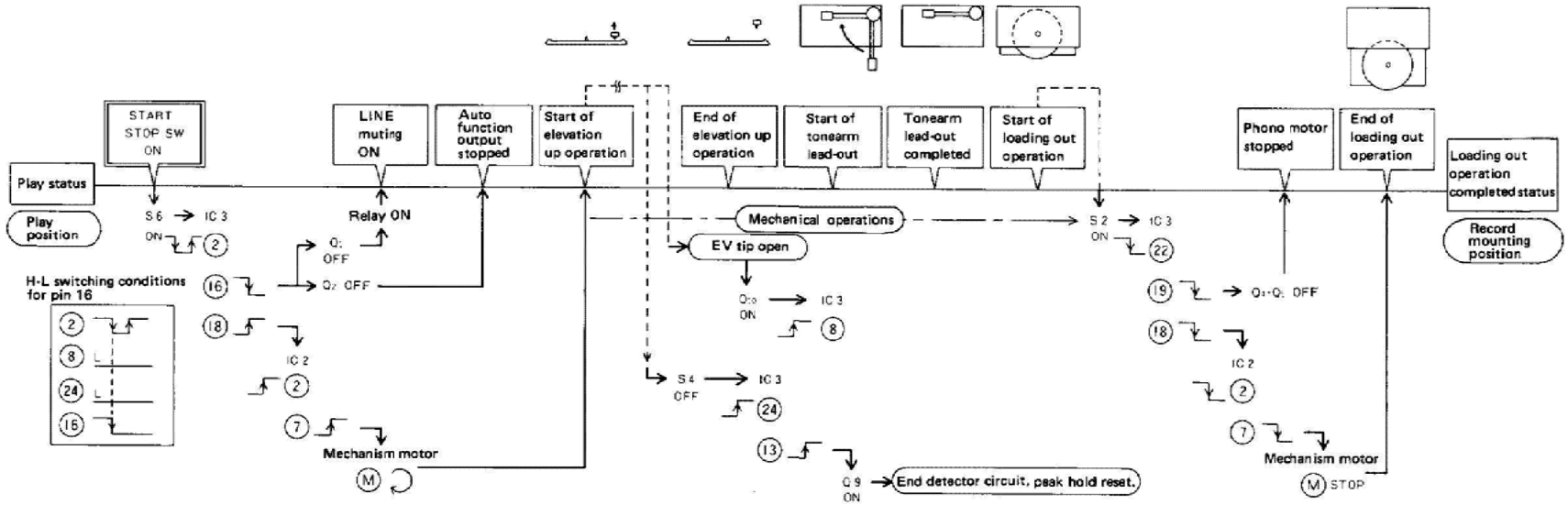
2.5 ARM ELEVATION DOWN OPERATION



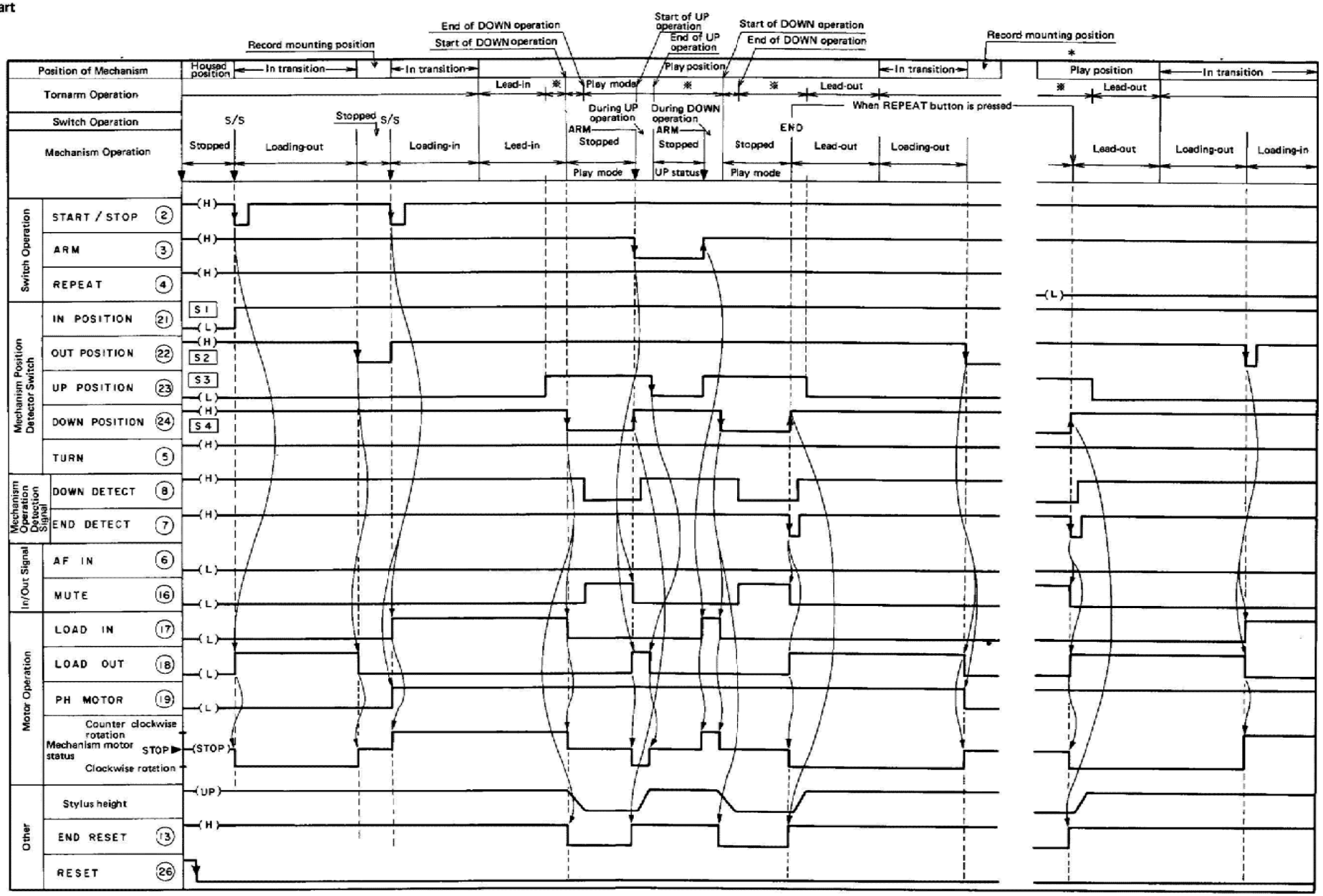
2. 6 AUTO RETURN OPERATION



2. 7 AUTO STOP OPERATION



Timing chart



PD4020 Pin Description

Pin No.	Pin Name	I/O	Symbol	Pin description		
1	CLOCK I	—	CL 1	Clock pin 1 (150kHz to 440kHz)		
2	START/STOP	Input	PC 0	Start/stop switch input	OFF	ON
3	ARM		PC 1	Arm elevation switch input	DOWN	UP
4	REPEAT		PC 2	Repeat switch input	OFF	ON
5	TURN		PC 3	Inverter switch input	OFF	ON
6	AF IN		PD 0	Auto function signal input	No signal	Signal applied
7	END DETECT		PD 1	End detector input	Not detected	Detected
8	DOWN DETECT		PD 2	Arm DOWN detector input	UP	DOWN
9			PD 3			
10			PE 0			
11			PE 1			
12			PE 2			
13	END RESET	Output	PE 3	End detector circuit peak hold reset output	Not reset	Reset
14	Vss	—	Vss	+10V		
15	TEST	—	TEST	Not used (fixed at H level)		
16	MUTE	Output	PF 0	Muting relay ON/OFF and auto function output switching	OFF	ON
17	LOAD IN	Output	PF 1	Mechanism motor loading in output	No loading in	Loading in operation
18	LOAD OUT	Output	PF 2	Mechanism motor loading out output	No loading out	Loading out operation
19	PH MOTOR	Output	PF 3	Phono motor rotation output	Stopped	Rotating
20			PG 0			
21	IN POSITION	Input	PA 0	Housed position detector input	Not housed	Housed
22	OUT POSITION	Input	PA 1	Record mounting position detector input	Not mounting	Mounting
23	UP POSITION	Input	PA 2	UP completed position detector input	Not in UP position	In UP position
24	DOWN POSITION	Input	PA 3	DOWN completed positionor input detector input	Not in DOWN position	In DOWN position
25	INTERRUPT	—	INT	Not used (fixed at H level)		
26	RESET	Input	RES	Initial CPU reset input	Reset	Normal
27	Vgg	—	Vgg	GND		
28	CLOCK 0	—	CL 0	Clock pin 0 (150kHz to 440kHz)		

BA6208 Pin Description

Pin No.	Pin Name	I/O	Symbol
1	NC		Vacant pin
2	B IN	Input	Loading out input
3	A IN		Loading in input
4	NC		Vacant pin
5	GND	—	
6	Vcc	—	+12V
7	B OUT	Output	Loading motor rotated clockwise by H level output
8	A OUT		Loading motor rotated counter clockwise by H level output
9	NC		Vacant pin

IN		OUT	
3	2	8	7
L	L	open	open
L	H	L	H
H	L	H	L
H	H	L	L

(H input voltage: 2.0V min.
L input voltage: 0.8V max.)

5.MAJOR COMPONENT ASSEMBLY/DISASSEMBLY

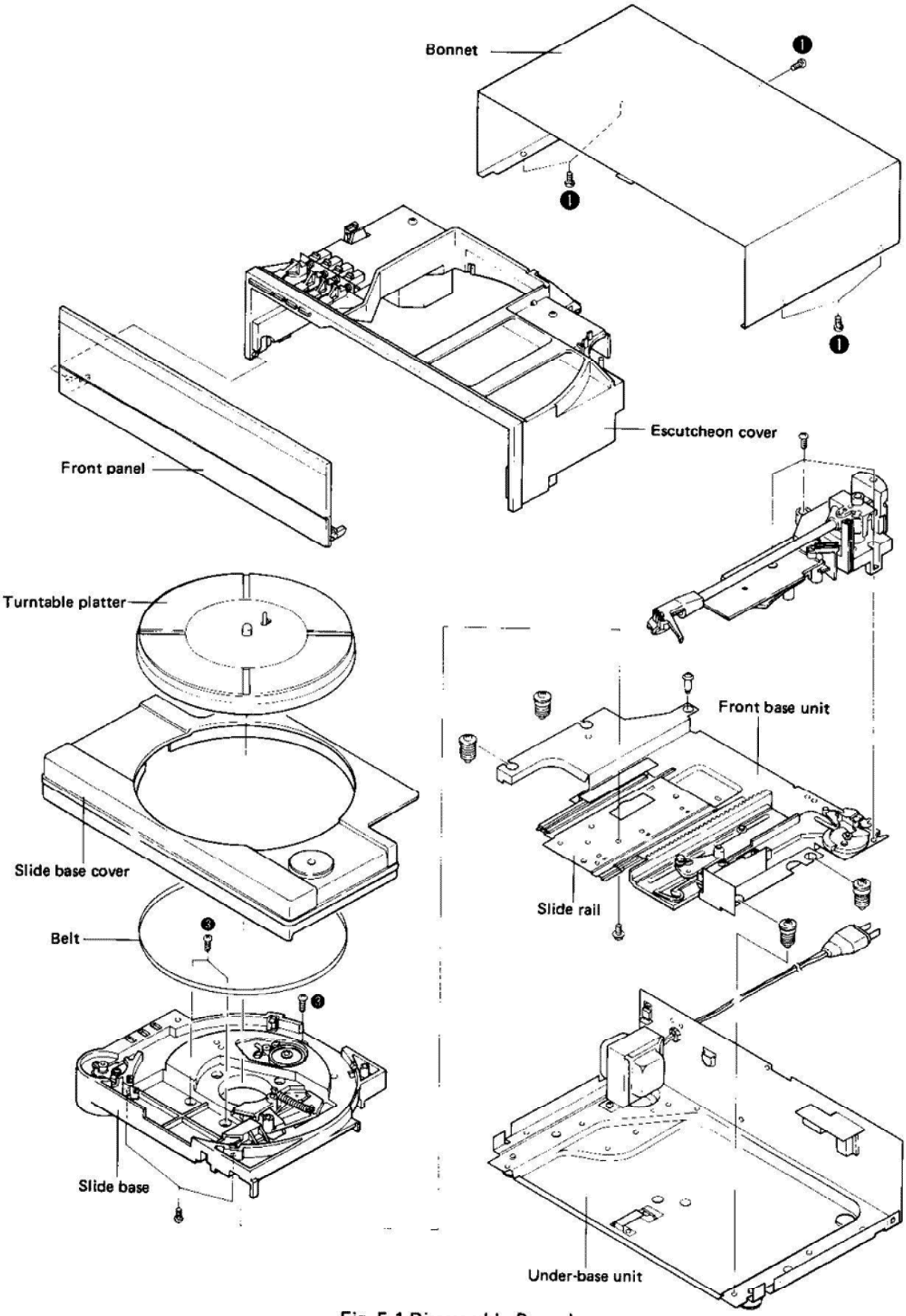


Fig. 5-1 Disassembly Procedures

1. To remove the bonnet case, undo screws 1 and pull the case off towards the rear.
2. The escutcheon cover is connected to the main under-base. First pull the front of the cover out and remove the front panel.

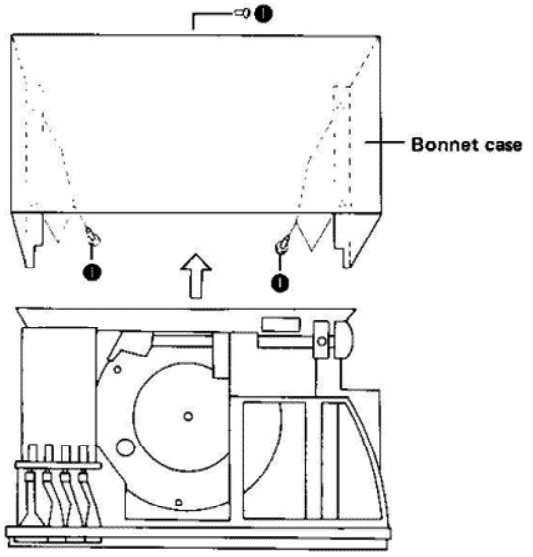


Fig. 5-2 Bonnet Case Removal

3. Press the micro switch (power switch) ON as shown in Fig. 5-3, and then the START/STOP switch.

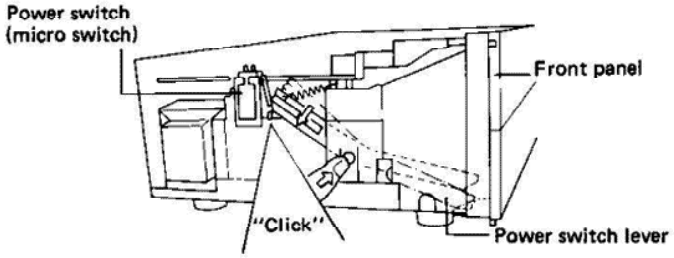


Fig. 5-3 Power Switch Setting

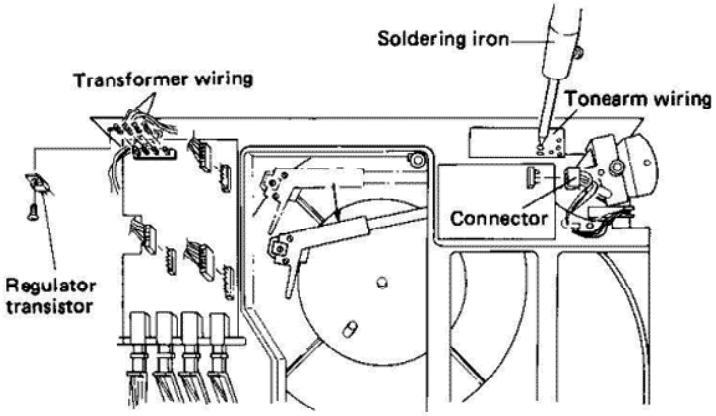


Fig. 5-4 Escutcheon Cover Removal

Mounting the Front Panel

The escutcheon cover is connected to the under-base with the front panel already fitted into position. There are two hooks (left and right) in the front, and two in the rear.

The PL-X7 has been designed to switch the power on and off when the front panel is opened and closed respectively. After the front panel has been mounted, the power switch is set by pressing the micro switch end of the power switch lever in the direction of the arrow by forefinger while holding the pivot of the lever by thumb with the front panel closed. The switch is set when a "click" sound is heard. Note that the slide base is in the housed position at this time (see Fig. 5-3).

4. The transformer wiring, the tonearm wiring, and the connector leads are located behind the escutcheon cover. Remove the transformer wiring wrapping, disconnect the tonearm wiring solder, and then disconnect the connectors. Finally, undo the regulator transistor screw (Fig. 5-4).
   * When conducting a check during operation, only disconnect the tonearm wiring and end sensor connector. And since the power switch is switched on and off by opening and closing of the front panel, the power switch is switched on by finger when conducting operational checks.
5. The escutcheon cover can be conveniently rotated through 180° to the rear by holding the front of the cover and taking care not to entangle the wiring.
6. The slide base cover is secured to the slide base by hooks. The two front positions are secured by screws. Undo these two screws as shown in Fig. 5-5, and while holding the turntable platter down, remove the slide base by lifting the front.

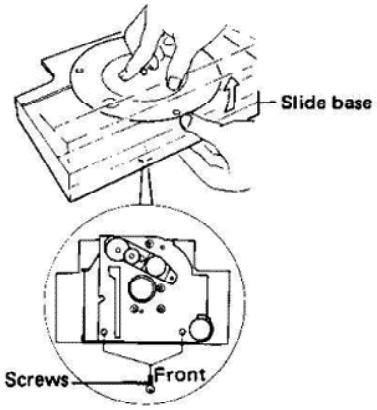


Fig. 5-5 Slide Base Removal

7. The PL-X7 turntable platter cannot be easily removed from the shaft assembly. With the slide base in the record mounting position, undo screw 2 under the slide rail to enable removal of the platter together with spindle bearing ass'y. Since the drive belt is passed around the turntable platter, carefully disengage it before removing the platter.

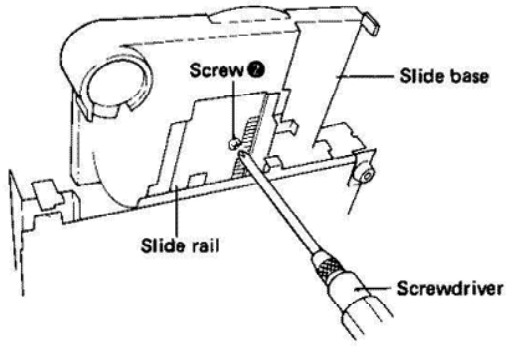


Fig. 5-6 Turntable Platter Removal

8. The slide base is removed after undoing screws 3 (See Fig. 5-7).

Mounting the Slide Base

Set the slide rail at a position about 20 mm from the record mounting position, and align the slide base with the slide rail positioning hole. The lock lever ass'y is engaged at this time while moving towards the rack (the ass'y being pressed against the slide base by the lock lever reset plate). (See Fig. 5-8).

The slide base can then be returned to the record mounting position by turning the slide base drive motor pulley counter clockwise by hand.

Finally, the presence detector and presence detector reset plates are set to the record mounting position. (See Fig. 5-9).

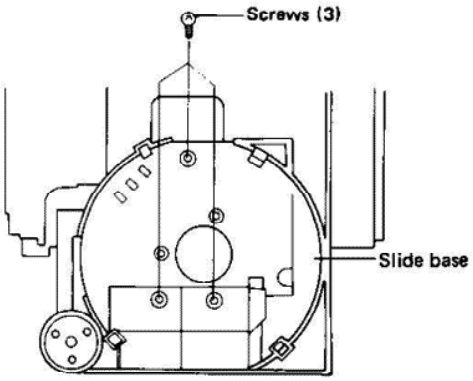


Fig. 5-7 Slide Base Removal

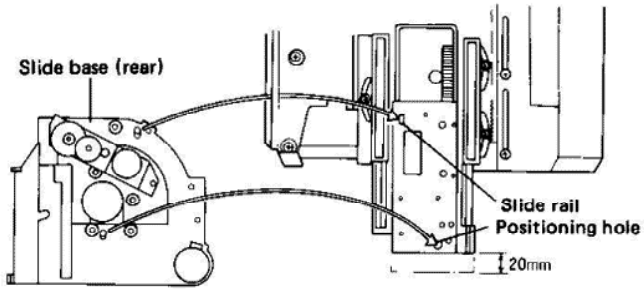


Fig. 5-8 Slide Base Mounting 1

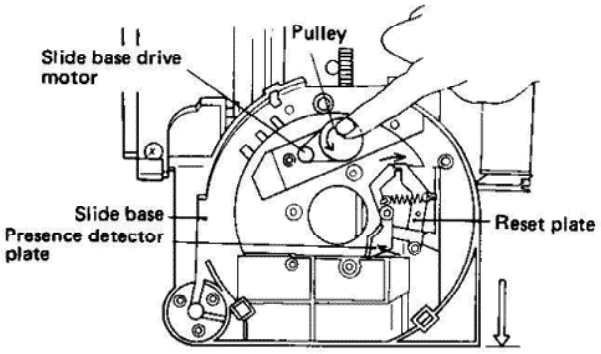


Fig. 5-9 Slide Base Mounting 2

9. The slide base drive motor is mounted on the rear of the slide base.
10. When removing the slide rail, take adequate precautions to ensure that none of the bearings are lost. (In the retainer unit state, bearings are inserted under pressure, and can easily be dislodged by knocking).

Mounting the Half-Speed Gear

When fitting the half-speed gear, apply torque grease of high viscosity to the retainer unit mounting position, insert the half-speed gear, and slide rail hole in alignment. Note that this gear is mounted with the turntable platter in the housed position.

After mounting, check that the slide rail moves smoothly (through at least 120 mm of movement).

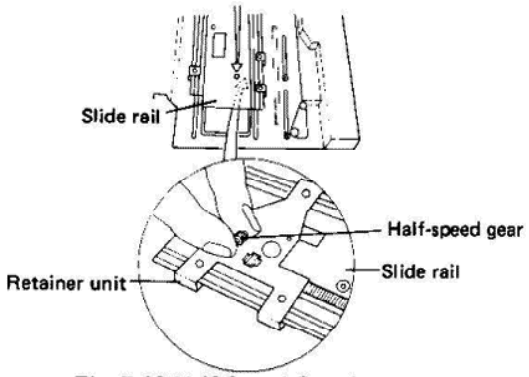


Fig. 5-10 Half-Speed Gear Insertion

11. The tonearm ass'y can be removed after undoing screw 4 . (See Fig. 5-11)

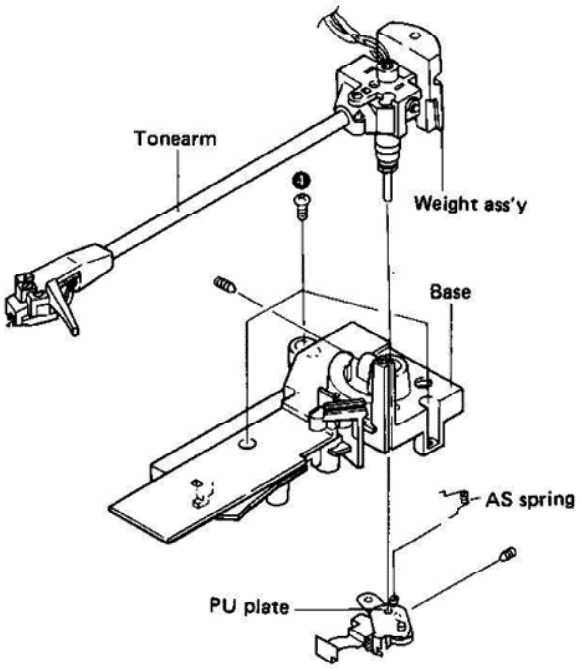


Fig. 5-11 Tonearm Ass'y Disassembly

12. The tonearm ass'y is mounted before mounting the slide base, and the PU plate shaft is mounted sandwiched between the drive plate and lead-in latch. (Slide the latch gear forward slightly and mount the plate with the lead-in latch open, returning the latch gear to its former position after completing the mounting). (See Fig. 5-12)

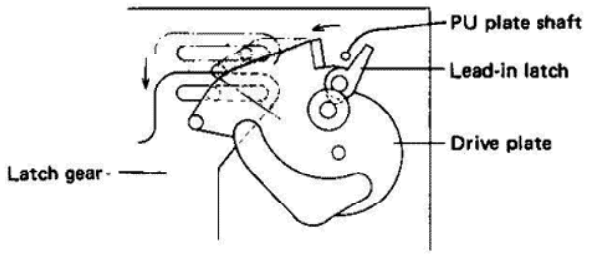


Fig. 5-12 Tonearm Mounting

Mounting the PU Plate

To mount the PU plate ass'y push the tonearm pivot shaft right back and tighten it in that position with the AS spring sandwiched between the arm base and PU plate, and with the toneam pipe parallel with the arm base. And in addition to centering the rotating position of the adjustment cam, make sure that section (B) of the PU plate ass'y is fixed in a position so as to reach the 30 cm lowering position of the index cam. (See figs. 5-13 and 5-14).

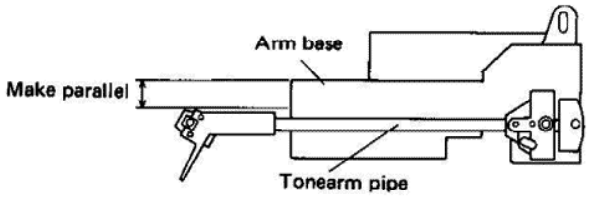


Fig. 5-13 PU Plate Mounting 1

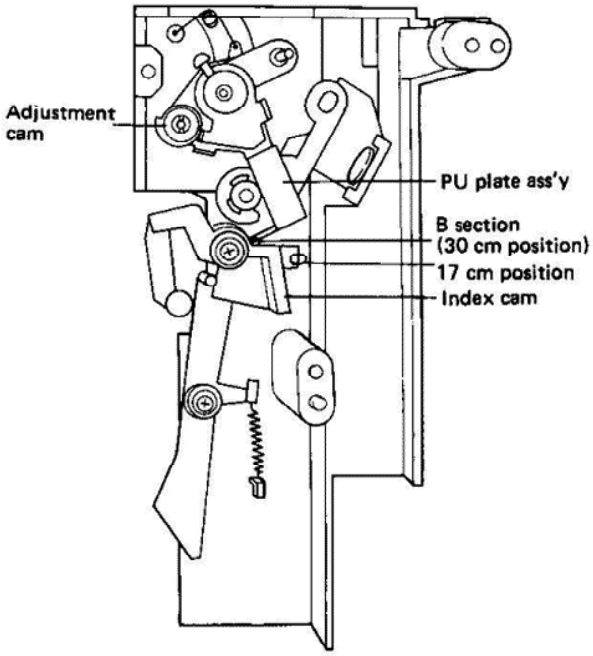


Fig. 5-14 PU Plate Mounting 2

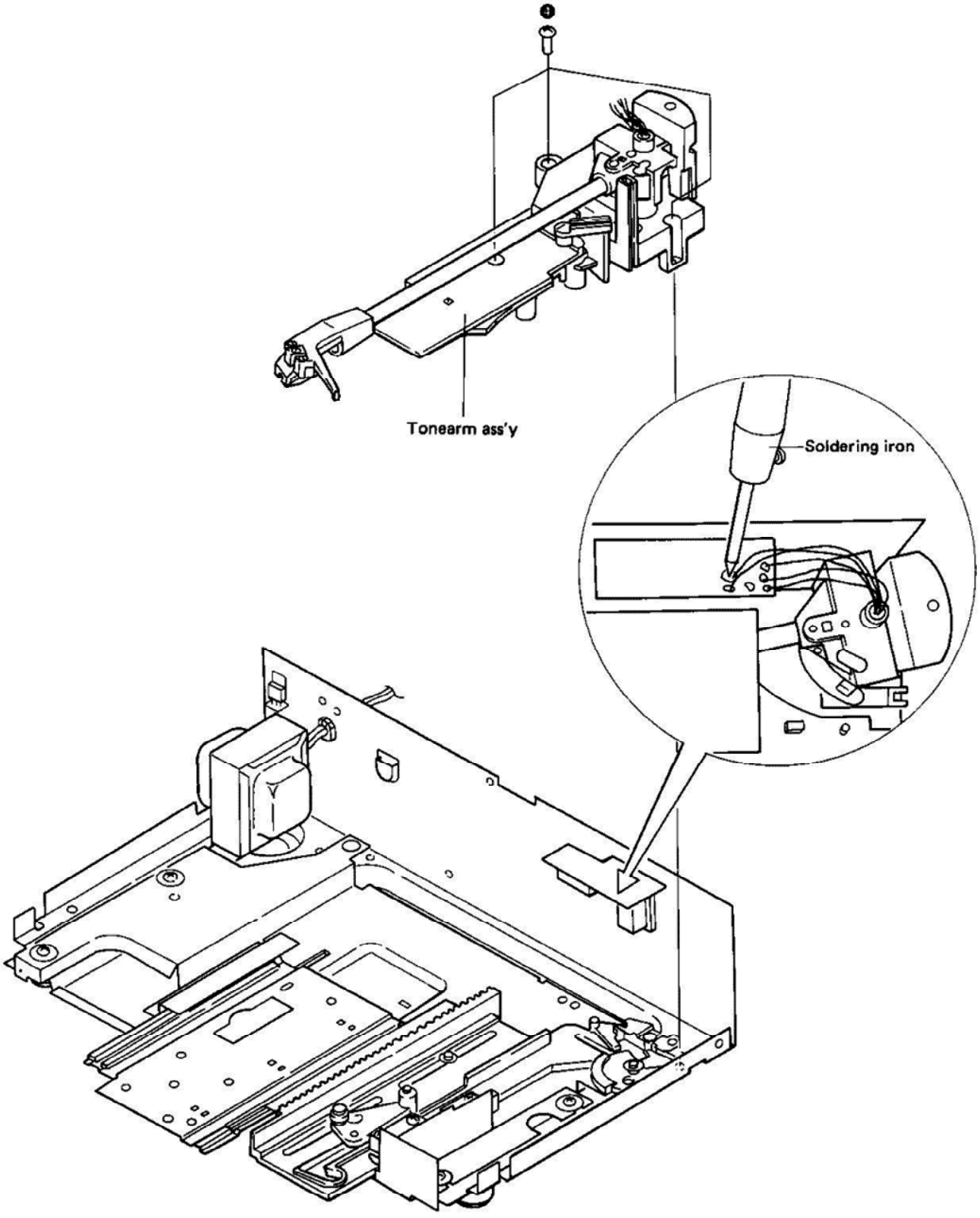


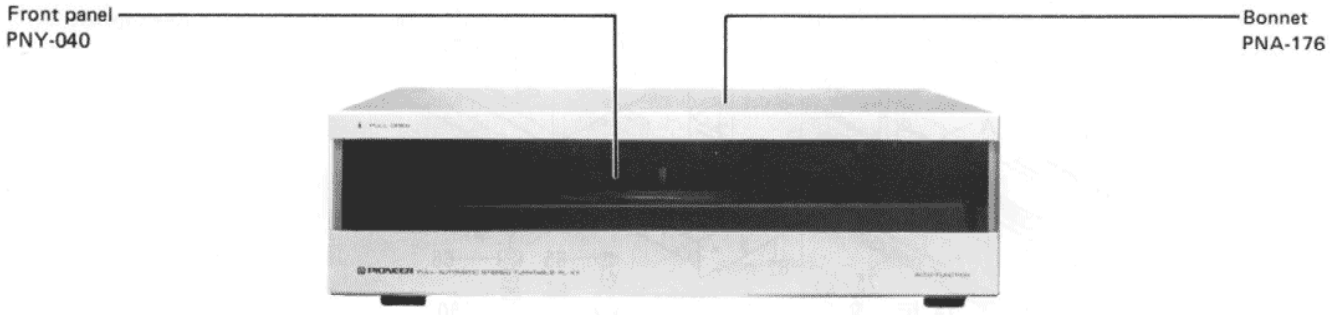
Fig. 5-15 Tonearm Removal

6.PARTS LOCATION

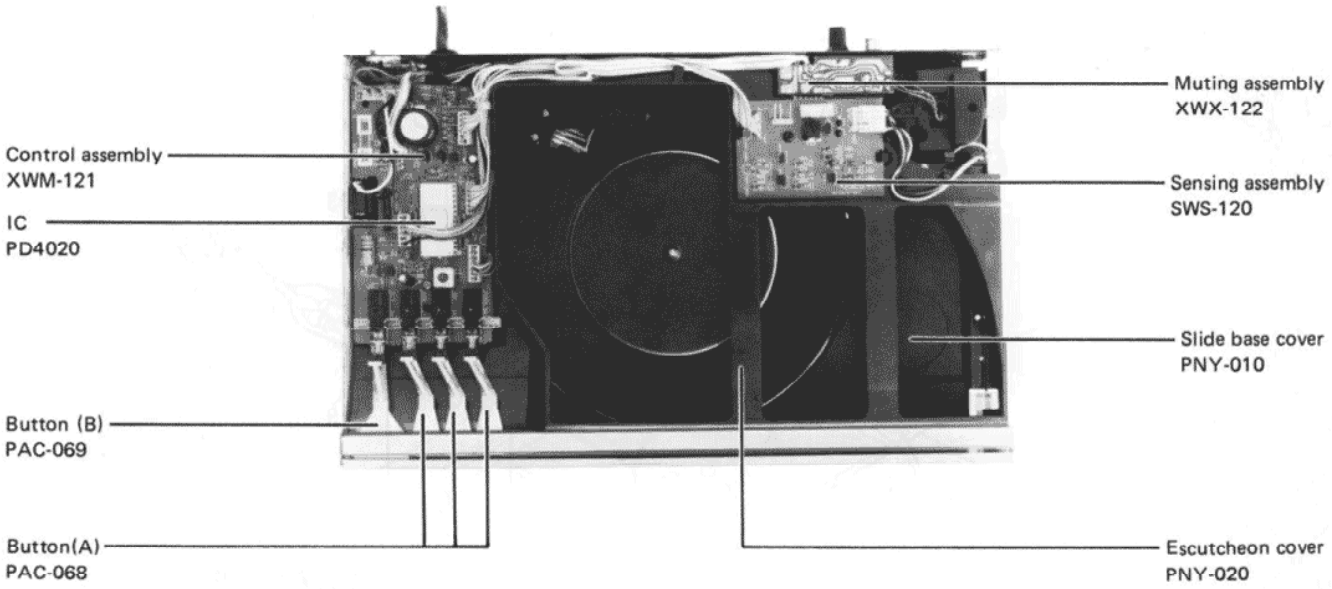
NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

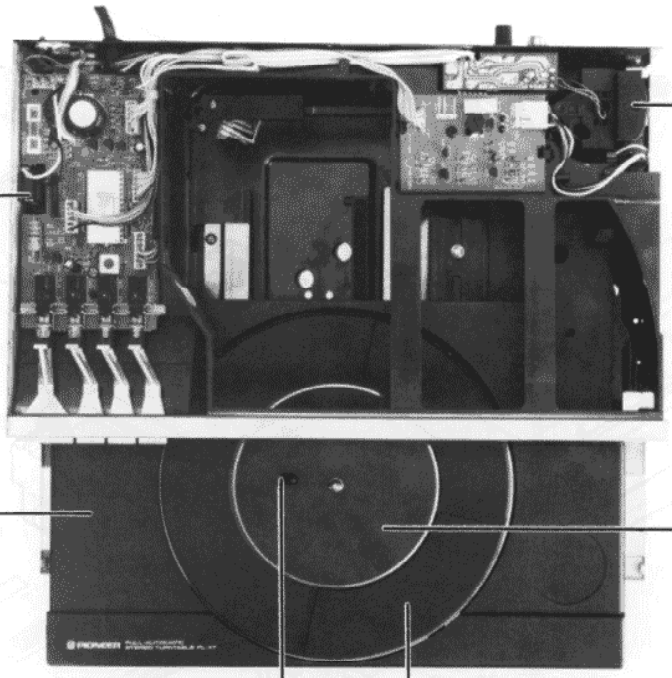
Front Panel View



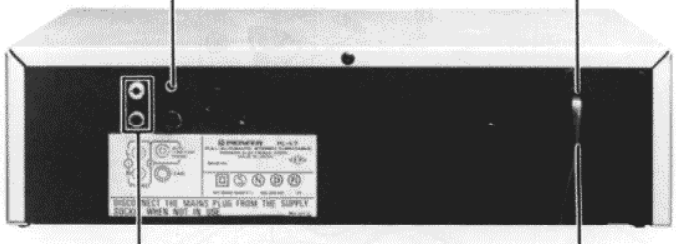
Top View I



Top View II

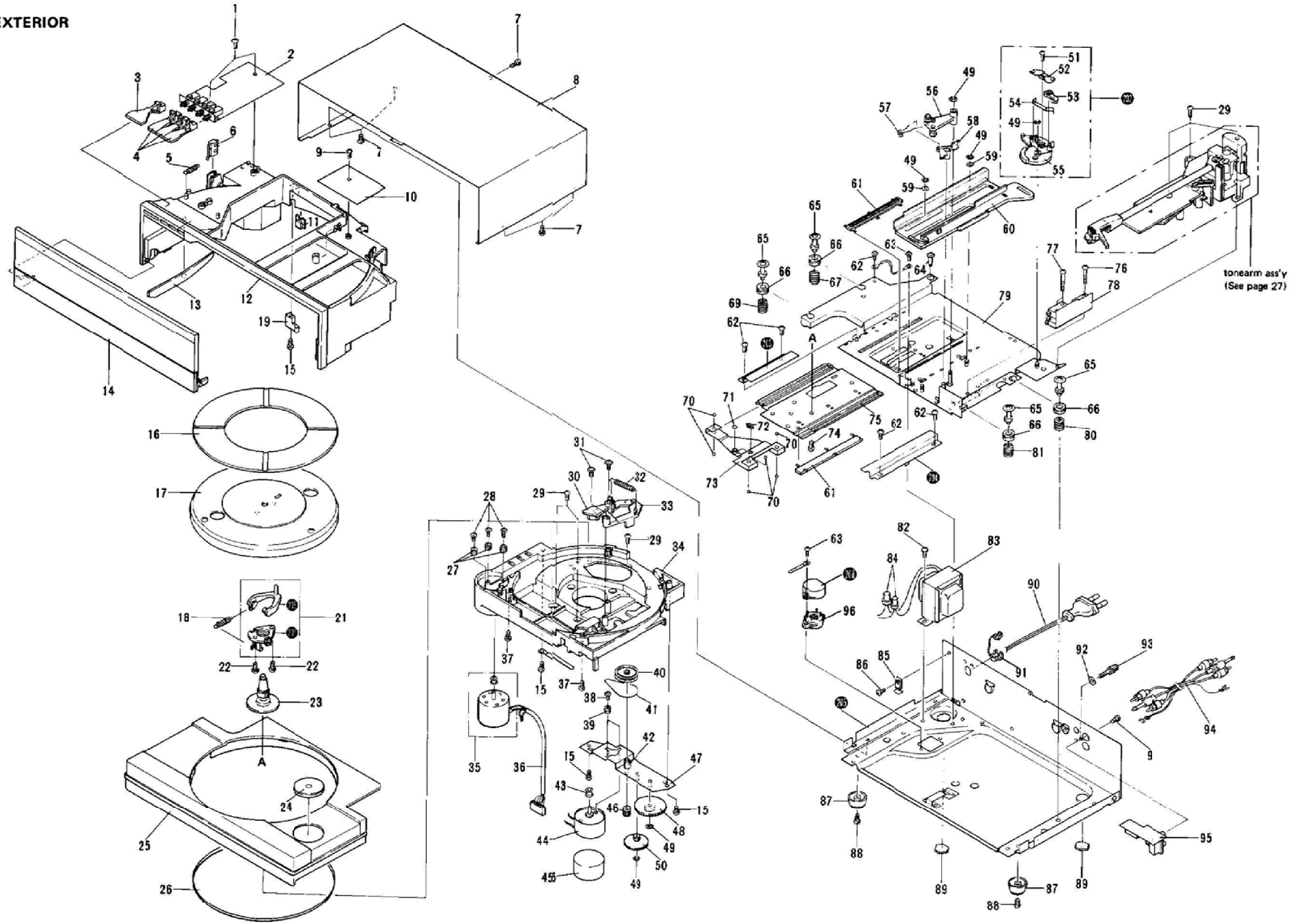


Rear Panel View



7.EXPLODED VIEW AND PARTS LIST

7. 1 EXTERIOR



NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List

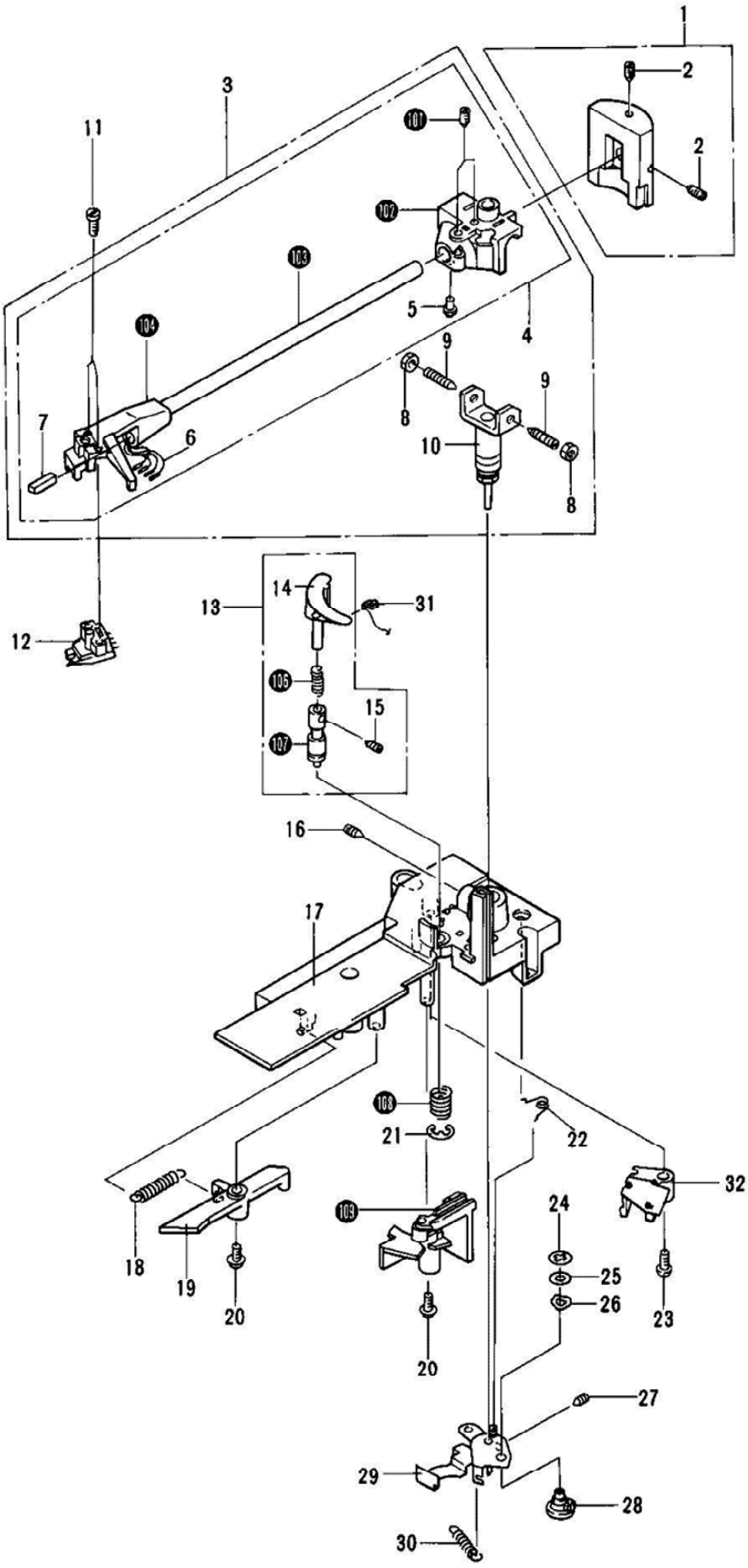
Mark	No.	Part No.	Description
	1.	PPZ30P080FMC	Screw
	2.	XWM-121	Control assembly
	3.	PAC-069	Button (B)
	4.	PAC-068	Button (A)
	5.	PBH-303	Switch lever spring
★★	6.	PSF-019	Microswitch
	7.	VTZ30P060FZK	Screw
	8.	PNA-176	Bonnet
	9.	PPZ30P080FZK	Screw
	10.	SWS-120	Sensing assembly
	11.	XWS-019	Switch assembly B
	12.	PNY-020	Escutcheon cover
	13.	PNX-225	Power switch lever
	14.	PNY-040	Front panel
	15.	PPZ30P080FMC	Screw
	16.	PEA-062	Rubber mat assembly
	17.	PXB-225	Turntable platter assembly
	18.	PBH-298	Sensing pin spring
	19.	PNX-316	Plate
	20.	.....	
	21.	PXB-261	Sensing pin assembly
	22.	PMB30P080FMC	Screw
	23.	PXB-236	Shaft assembly
	24.	PNX-442	EP adaptor
	25.	PNY-010	Slide base cover
★★	26.	PEB-183	Belt
	27.	PEB-172	Rubber cushion
	28.	PBA-112	Screw
	29.	VDZ30P060FMC	Screw
	30.	PNX-238	Presence detector plate
	31.	IPZ30P080FMC	Screw
	32.	PBH-300	Spring
	33.	PNX-239	Reset plate
	34.	PNX-221	Slide base
	35.	PYY-105	Motor assembly
	36.	PDE-119	Connector assembly (M)
	37.	PPZ30P120FZK	Screw
	38.	PBA-125	Screw
	39.	PEB-184	Rubber cushion
	40.	PNX-308	Pulley
	41.	PEB-185	Belt
	42.	PLB-127	Gear A shaft
	43.	PLM-006	Motor pulley
	44.	PXM-100	Motor
	45.	PNC-199	Shield plate
	46.	PNX-240	Gear A
	47.	PXT-455	Chassis unit
	48.	PNX-306	Gear C
	49.	YE30S	Washer
	50.	PNX-241	Gear B
	51.	PPZ30P050FMC	Screw
	52.	PNC-198	Holder
	53.	PNX-237	Lead in ratch
	54.	PBK-051	Plate spring
	55.	PNX-236	Driving plate
	56.	PXB-256	Lock lever assembly
	57.	PBH-354	Spring
	58.	PNX-234	Lock lever reset plate
	59.	WA41D065D025	Washer
	60.	PNX-233	Lack gear
	61.	PNX-232	Slide rail lack
	62.	VDZ30P060FZK	Screw
	63.	PDZ30P060FMC	Screw
	64.	PBA-148	Screw
	65.	PBA-121	Screw
	66.	PEB-240	Damper rubber
	67.	PBH-318	Spring (C)
	68.	.....	
	69.	PBH-317	Spring (B)
	70.		Steel ball 4φ
	71.		Steel ball 5.5φ
	72.	PNX-231	Gear
	73.	PNX-230	Retainer
	74.	LMZ30P080FMC	Screw
	75.	PNC-228	Slide rail
	76.	PBA-138	Screw A
	77.	PBA-139	Screw B
	78.	XWS-018	Switch assembly A
	79.	PXV-005	Float base unit
	80.	PBH-310	Spring (A)
	81.	PBH-323	Spring (D)
	82.	PMA40P050FMC	Screw
⚠ ★	83.	PTT-165	Power transformer (220/240V)
⚠	84.	PBM-008	Wire nut
	85.	XWX-121	IC assembly
	86.	PDZ30P060FZK	Screw
	87.	PEC-085	Foot
	88.	VTZ30P100FMC	Screw
	89.	PEC-082	Stopper
⚠	90.	PDG-033	Power cord (HE)
⚠		PDF-190	Power cord (HB)

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	91.	PEC-048	Strain relief		201.		.....
	92.	WA35F100N080	Washer		202.		Driving plate assembly
	93.	PKE-001	Screw		203.		Rail cover (R)
	94.	PDE-100	PU cord		204.		Rail cover (L)
	95.	XWX-122	Muting assembly		205.		Under-base unit
⚠	96.	PSB-013	Line voltage selector		206.		Sensing pin
					207.		Sensing pin holder
					208.		Line voltage selector cover

7.2 TONE ARM

Parts List

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	PNR-534	Weight		21.	YE70S	Washer
	2.	ZMK50H100FBT	Screw		22.	PBH-349	As spring
	3.	PPD-632	Tonearm assembly		23	PPZ30P080FMC	Screw
	4.	PXB-546	Pipe holder assembly		24.	YS40S	Washer
	5.	PLB-831	EV chip		25.	WC40FMC	Washer
	6.	PDF-555	Terminal chip assembly		26.	PNC-227	PU spring washer
	7.	PED-508	Stopper		27.	ZMD40H060FMC	Screw
	8.	NB30FZB	Nut		28.	PNX-228	Cam
	9.	PLA-580	Pivot		29.	PXB-251	PU plate assembly
	10.	PXA-878	Holder assembly		30.	PBH-299	PU plate spring
					31.	PNC-267	EV clip
	11	PBA-537	Cartridge mounting screw		32.	PWM-122	Senser assembly
	12	PPB-944	Cartridge assembly				
	13.	PXB-290	EV sheet assembly		101.		Screw
	14.	PXV-004	EV sheet unit		102		Pipe holder
	15.	ZMK30H040FZK	Screw		103.		Tonearm pipe
					104.		Head shell
	16.	ZMK40H100FZK	Screw		105.		.....
	17.	PNX-223	Tonearm base				
	18.	PBH-300	Reset lever spring		106.		EV adjustment spring
	19.	PNX-229	Reset lever		107.		EV shaft
	20.	IPZ30P080FMC	Screw		108.		EV spring
					109.		Index cam assembly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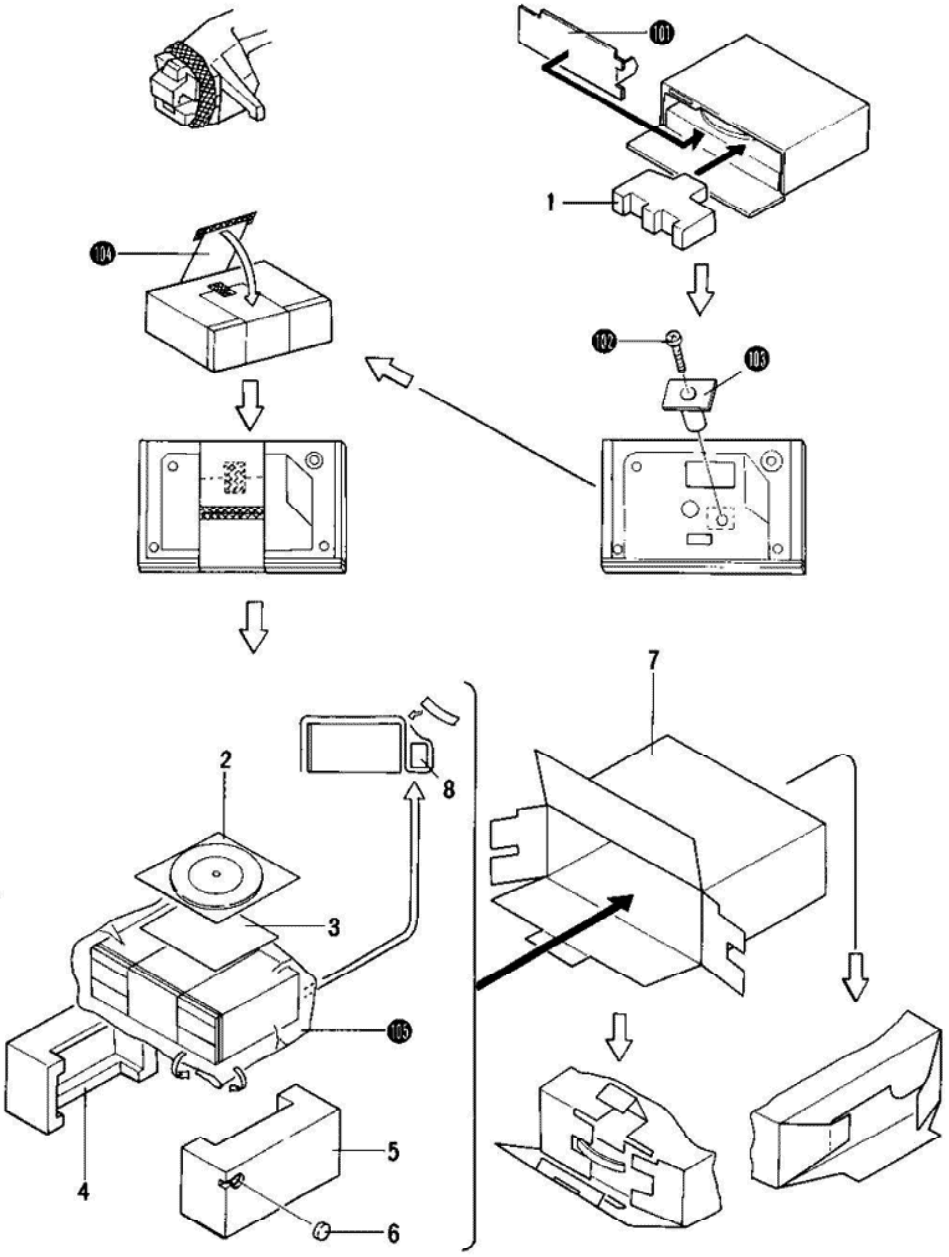
8.PACKING



Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	PHA-148	Turntable packing		6.	PNX-442	EP adaptor
	2.	PEA-062	Rubber mat assembly		7.	PHH-031	Packing case
	3.	PRE-009	Operating instructions (HE)		8.	PDE-100	PU cord
		PRB-228	Operating instructions (HB)				
	4.	PHA-129	Protector (L)		101.		Spacer
	5.	PHA-130	Protector (R)		102.		Screw
					103.		Spacer
					104.		Sheet
					105.		Sheet

9. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561 .....*	*RD¼PS 5611 J*
47kΩ	*47 × 10³*	*473 .....*	*RD¼PS 4733 J*
0.5Ω	*0R5*	*.....*	*RN2H 0R55 K*
1Ω	*010*	*.....*	*RS1P 0100 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621 ....*	*RN¼SR 56212 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*

  ★★ GENERALLY MOVES FASTER THAN ★

  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

Mark	Part No.	Symbol & Description
	XWM-121	Control assembly
★	XWX-120	Sensing assembly
	XWX-121	IC assembly
	XWS-019	Switch assembly B
	XWX-122	Muting assembly
	XWS-018	Switch assembly A
	PWM-122	Senser assembly
★★	PYY-105	Motor assembly
★★	PXM-100	Motor
⚠ ★	PTT-165	Power transformer (220/240V)
⚠	PDG-033	Power cord (HE)
⚠	PDF-190	Power cord (HB)
★★	PSF-019	Microswitch (Power)
	PDE-119	Connector assembly (M)
⚠	PSB-013	Line voltage selector

CONTROL ASSEMBLY (XWM-121)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	BA6208	IC2
★★	PD4020	IC3
★★	2SC1815 (2SC2458) (2SC945)	Q1 – Q4, Q6
★★	2SA562TM	Q5
★	WL02	D1
★	IS2473	D2 – D4
★	RD3.6EB	D6

SWITCHES, COILS

Mark	Part No.	Symbol & Description
	PSG-034	S6 – S9 Function switch
	LAL03T220K	L1 Coil
	PTL-015	L2 Coil (OSC)

CAPACITORS

Mark	Part No.	Symbol & Description
★★	CKDYF 473Z 50	C1
	PCL-043	C2
	CEA 100M 16L	C3, C5, C6
	CKDYF 103Z 50	C4

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	PCP-067 (PCP-068)	VR1 Semi-fixed
★	PCP-069	VR2 Semi-fixed
	RGSD6X223J	R12, R14
	RGSD4x223J	R13
	RS2PFL220J	R7
	RD¼PM □□□J	R1 – R6, R8 – R10, R15

MUTING ASSEMBLY (XWX-122)

Mark	Part No.	Symbol & Description
★	1S2473	D5
	PKB-003	Pin jack
	PSR-005	Relay
	PDE-208	Connector assembly

SWITCH ASSEMBLY A (XWS-018)

Mark	Part No.	Symbol & Description
★★	PSH-005	S1, S2 Slide switch
★★	PSH-006	S3, S4 Slide switch
	PDE-207	Connector assembly

SENSING ASSEMBLY (XWX-120)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SC1815 (2SC 2458) (2SC 945)	Q7, Q9
★★	2SC945	Q8
★★	2SA1048 (2SA1015) (2SA733)	Q10
★	VD 1222	D7, D8
★	RD3.6EB	D9
★	1S2473	D10

CAPACITOR

Mark	Part No.	Symbol & Description
	CSZA 6R8K 16	C8

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
★	PCP-044	VR3 Semi-fixed
	RS1PF 101J	R20
	RN¼PR 1503F	R27
	RD¼PM □□□J	R21 – R26, R28 – R30

IC ASSEMBLY (XWX-121)

SEMICONDUCTOR

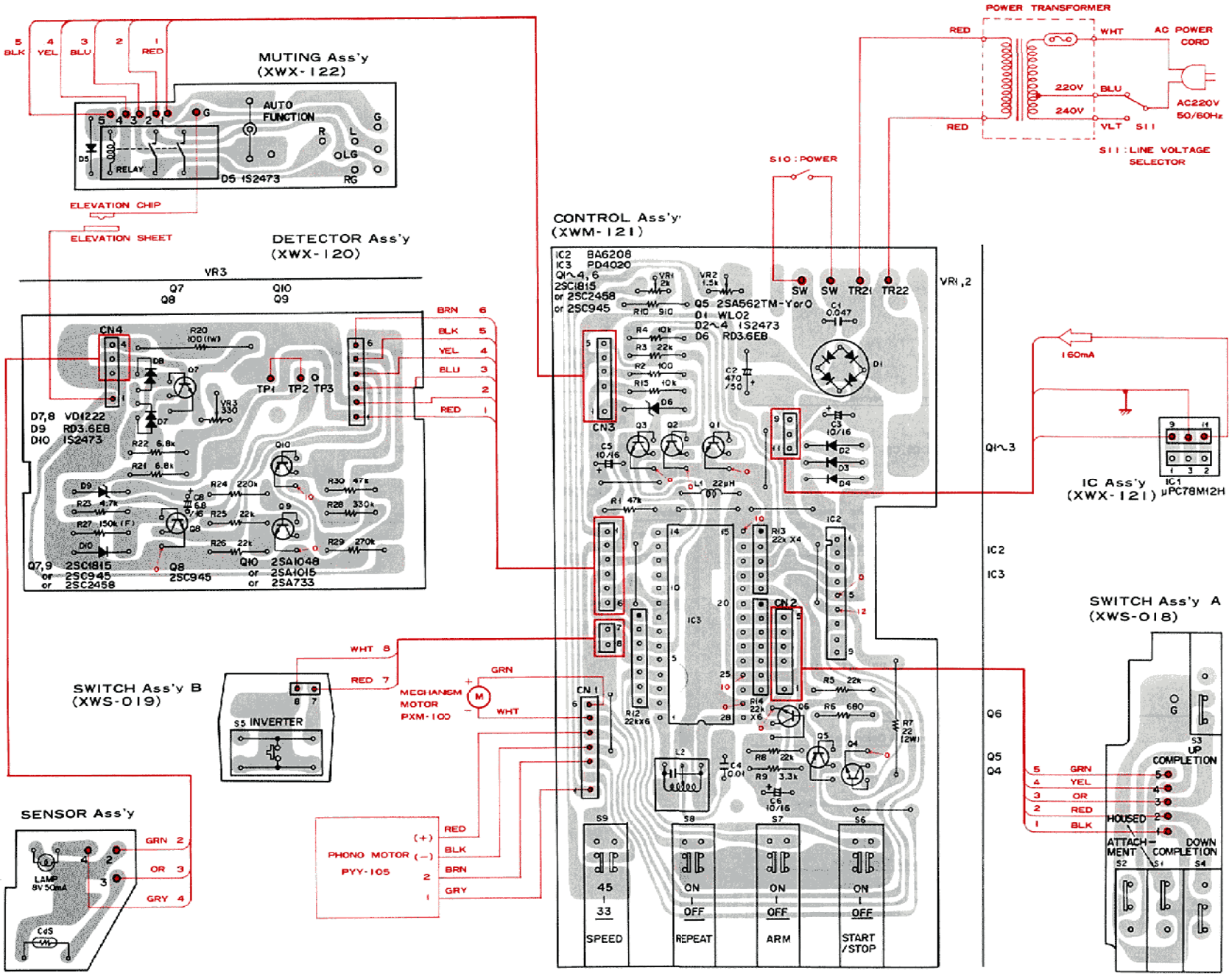
Mark	Part No.	Symbol & Description
★★	μPC78M12H	IC1

SWITCH ASSEMBLY (XWS-019)

SWITCH

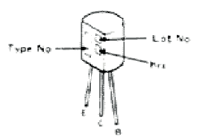
Mark	Part No.	Symbol & Description
★★	PSG-025	S5

10.P.C. BOARDS CONNECTION DIAGRAM

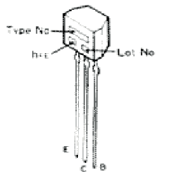


External Appearance of Transistors & ICs.

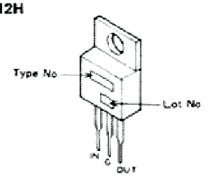
2SA562TM
2SA733
2SA1015
2SC945
2SC1815



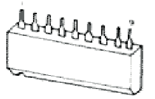
2SA1048
2SC2458



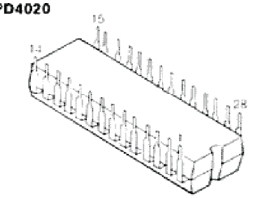
μPC78M12H



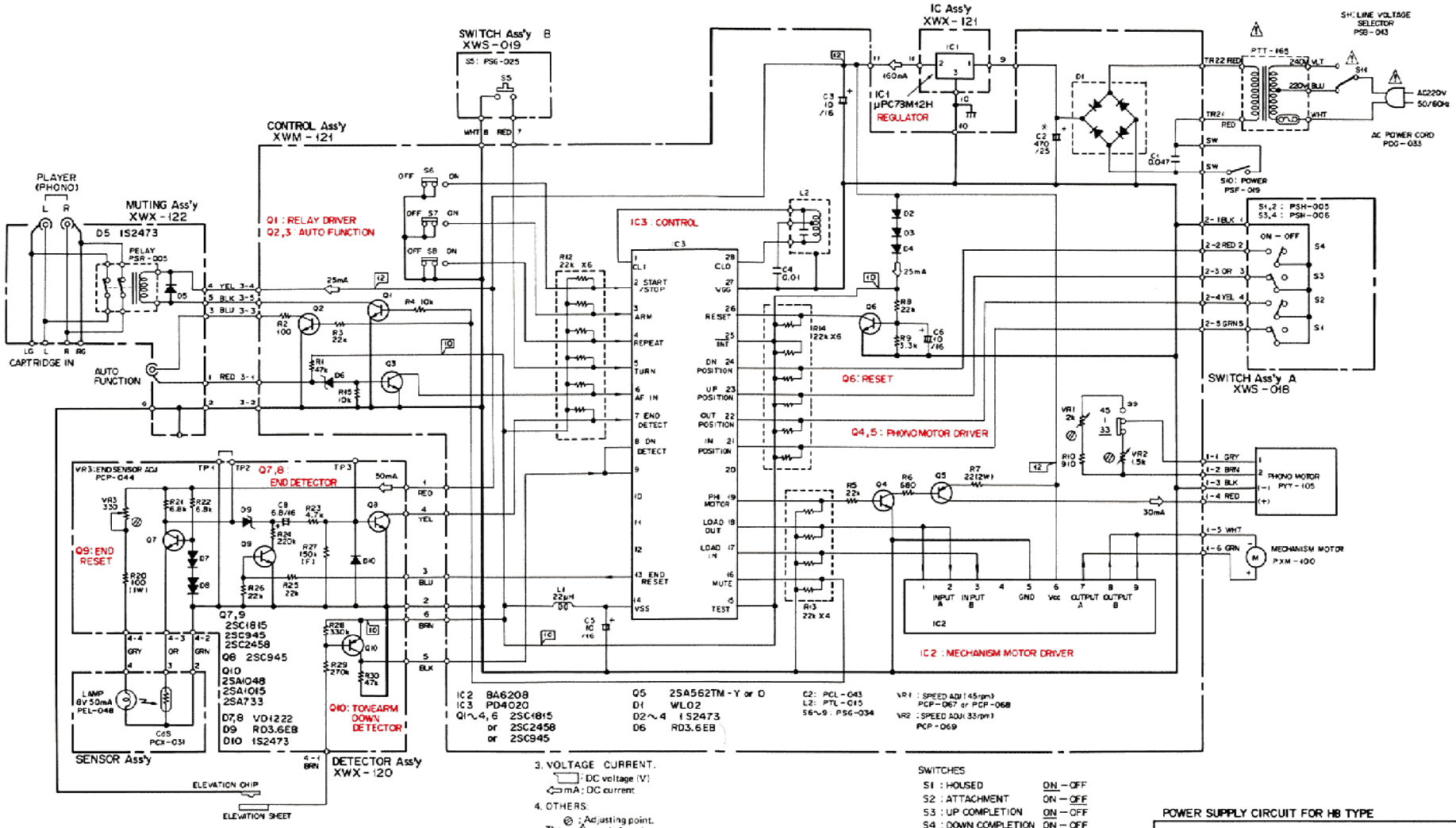
BA6208



PD4020



11.SCHEMATIC DIAGRAM



1. RESISTORS.
Indicated in Ω, ¼W, ⅛W, ±5% tolerance unless otherwise noted k, kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K), ±10%, (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT.
⊐ : DC voltage (V)
⇦ mA ; DC current

4. OTHERS:
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

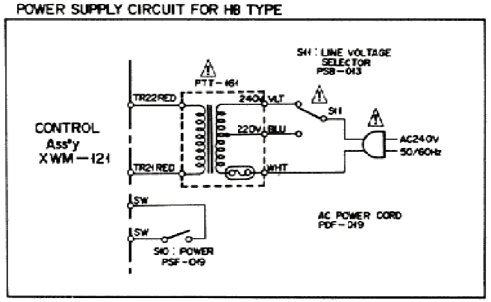
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES

S1 : HOUSED	ON — OFF
S2 : ATTACHMENT	ON — OFF
S3 : UP COMPLETION	ON — OFF
S4 : DOWN COMPLETION	ON — OFF
S5 : INVERTER	ON — OFF
S6 : START/STOP	ON — OFF
S7 : ARM	ON — OFF
S8 : REPEAT	ON — OFF
S9 : SPEED	33 1/3rpm — 45rpm
S10 : POWER	ON — OFF
SH : LINE VOLTAGE SELECTOR	220V — 240V

The underlined indicates the switch position.

POWER SUPPLY CIRCUIT FOR HB TYPE

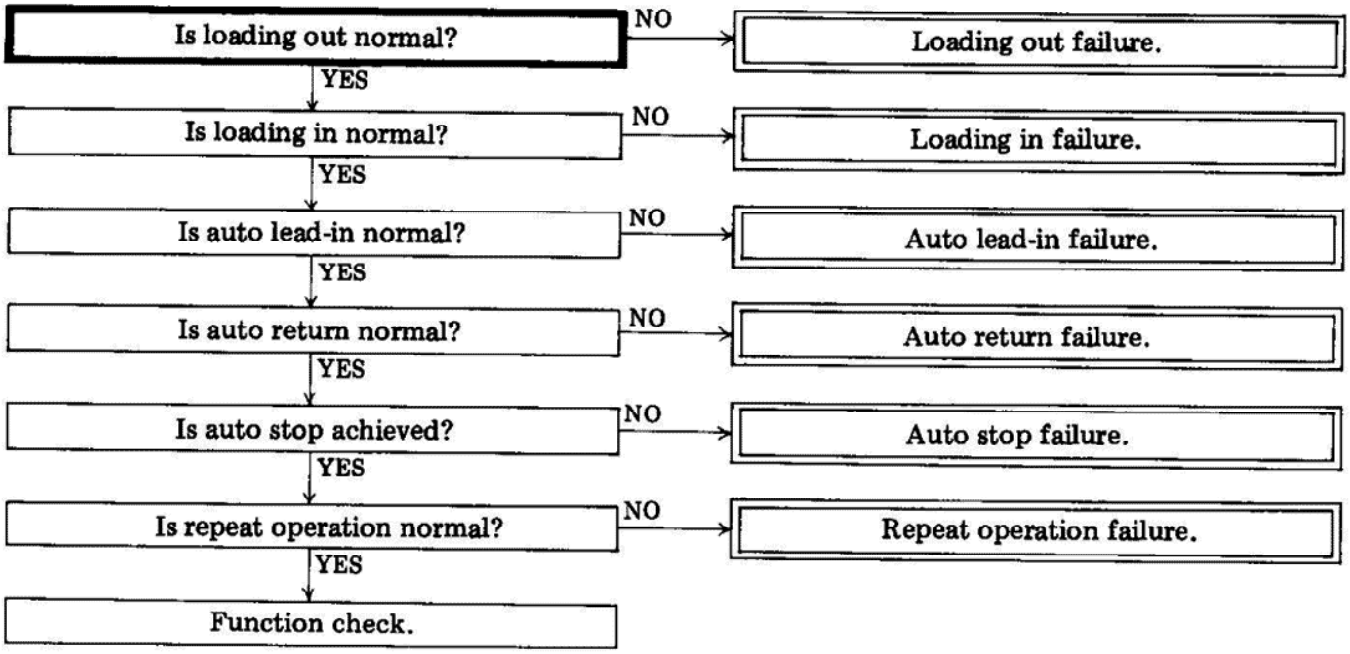


NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

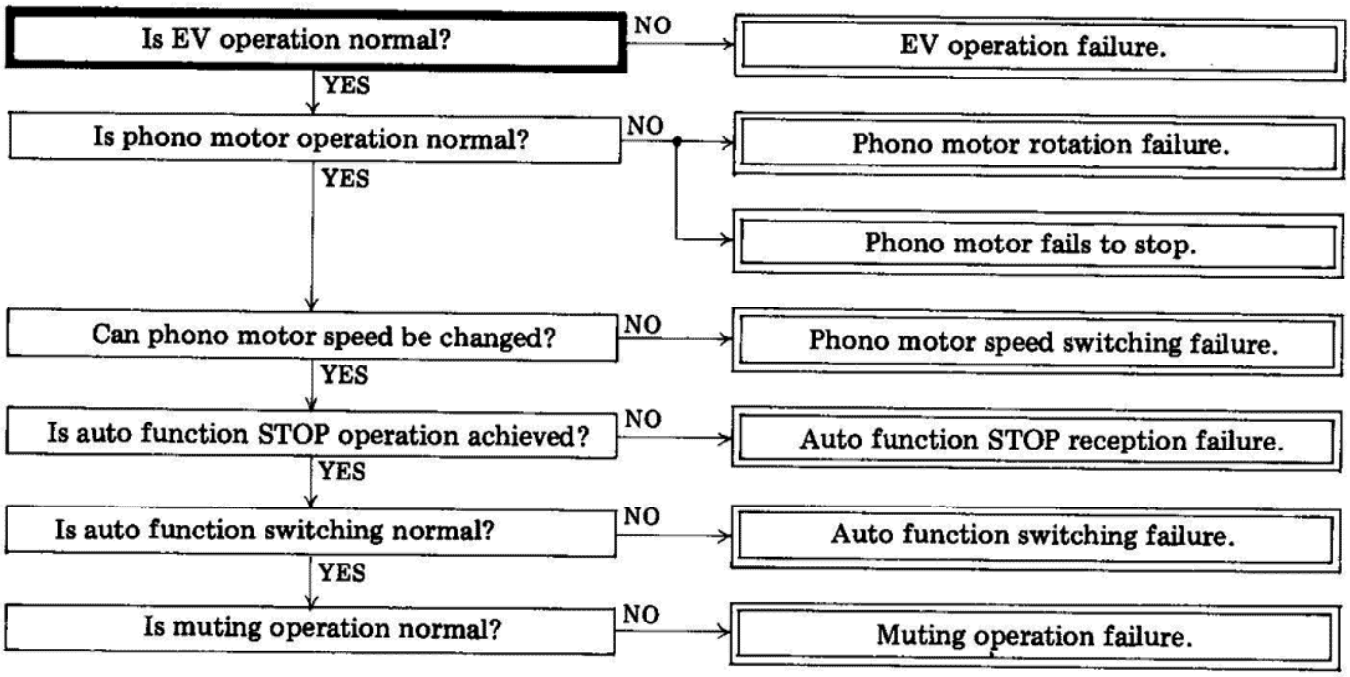
12.TROUBLESHOOTING

* When a PL-X7 requires repair, first locate the position of the trouble from the operational checks outlined below, then proceed with the relevant detailed chart.
Blocks indicated by ▭ denote detailed charts on subsequent page.

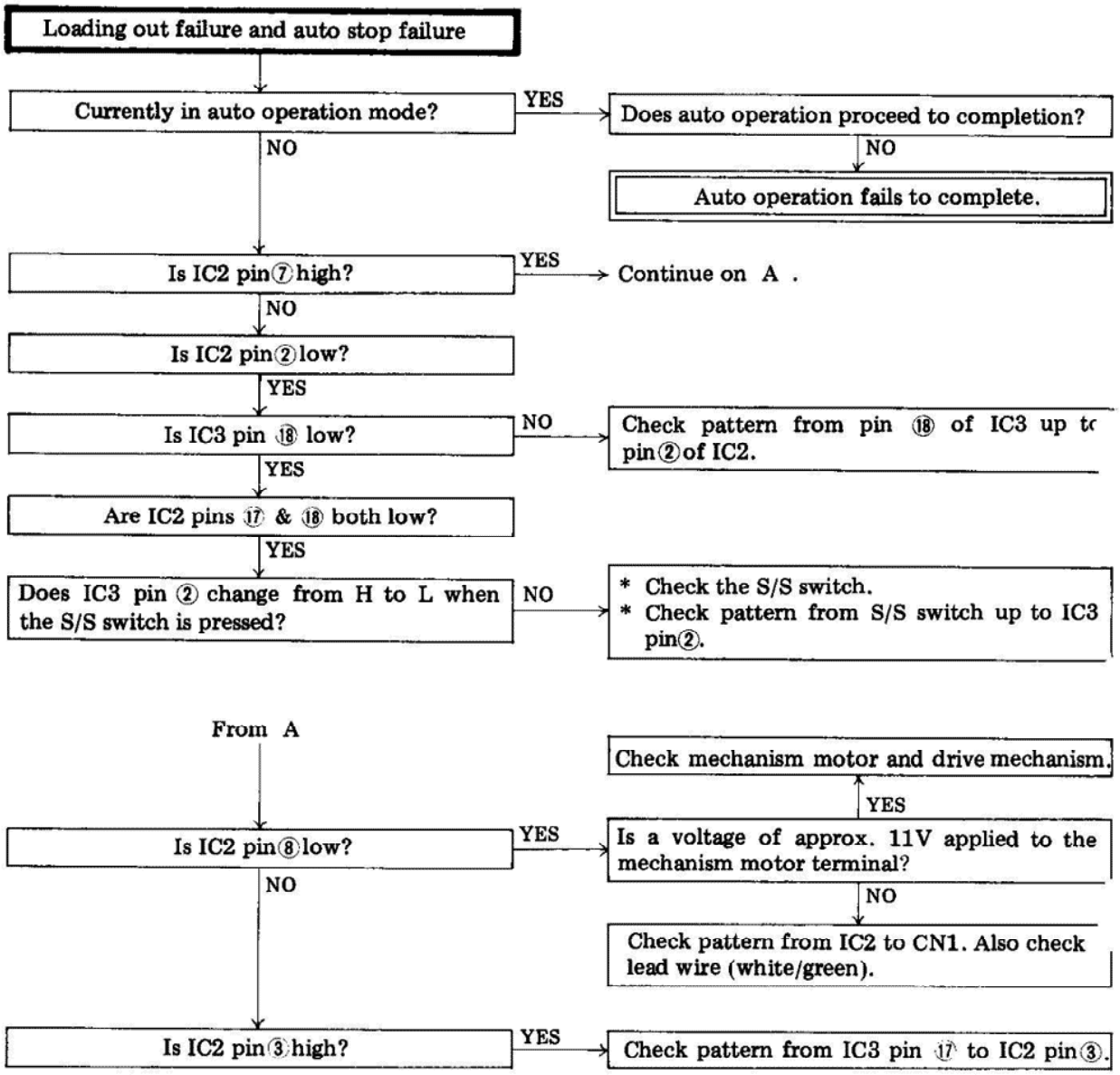
■ **Auto Operation Check**



■ **Function Check**

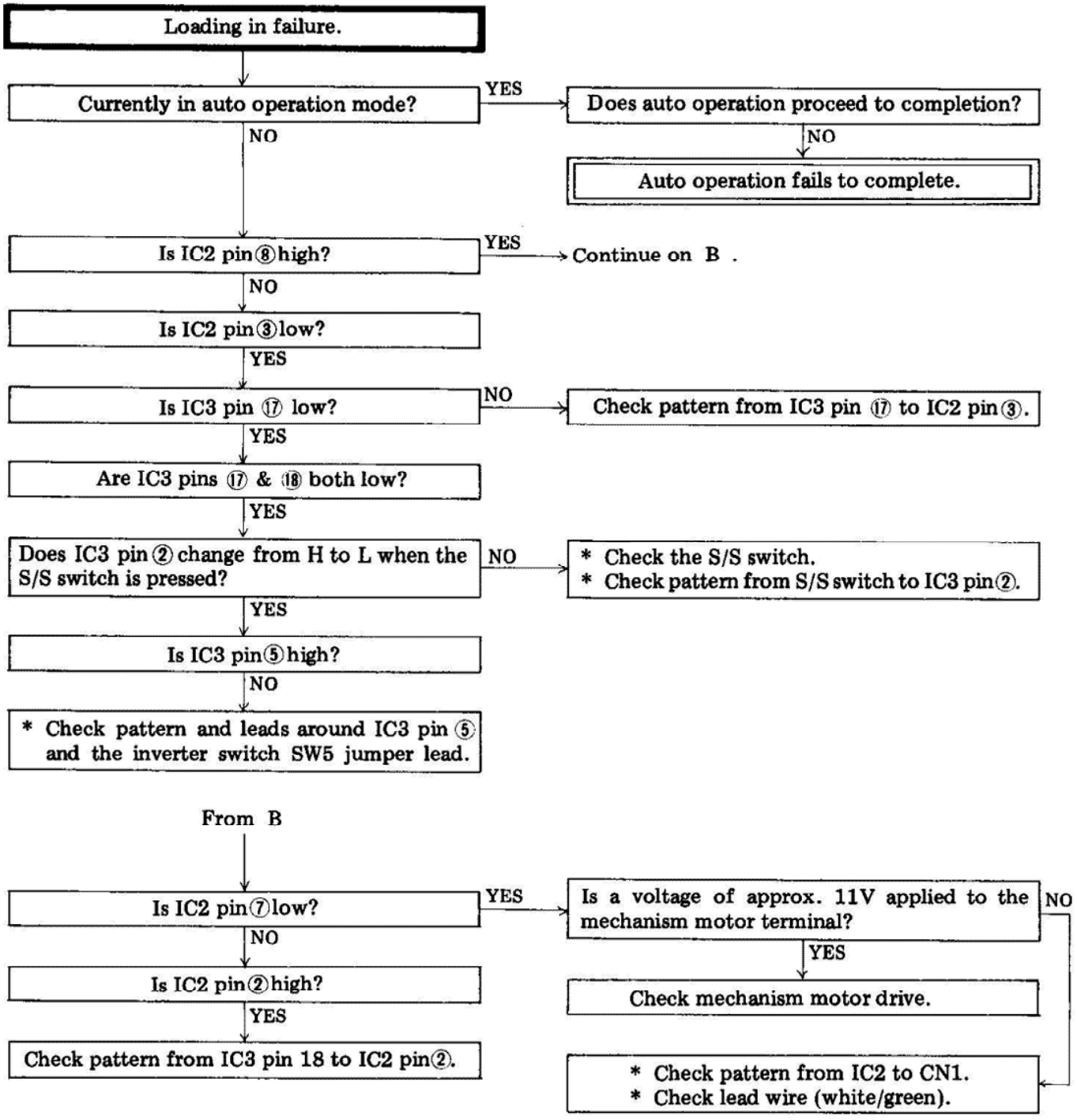


■ **Loading Out Failure, and Auto Stop Failure**

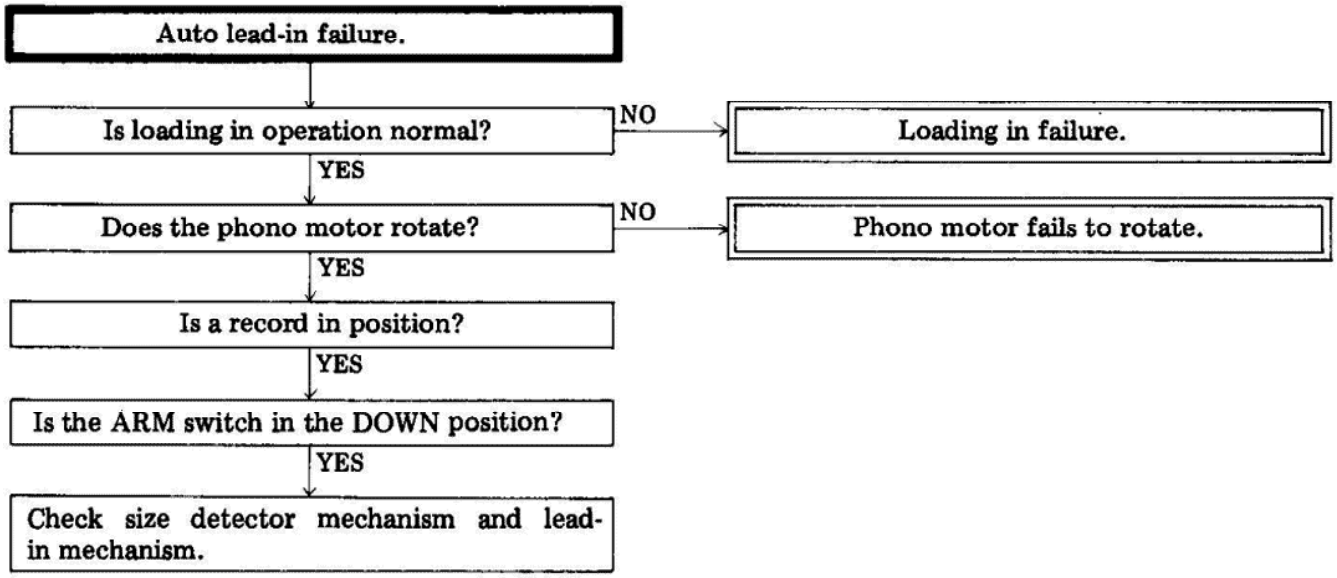


Note: S/S switch denotes START/STOP switch.

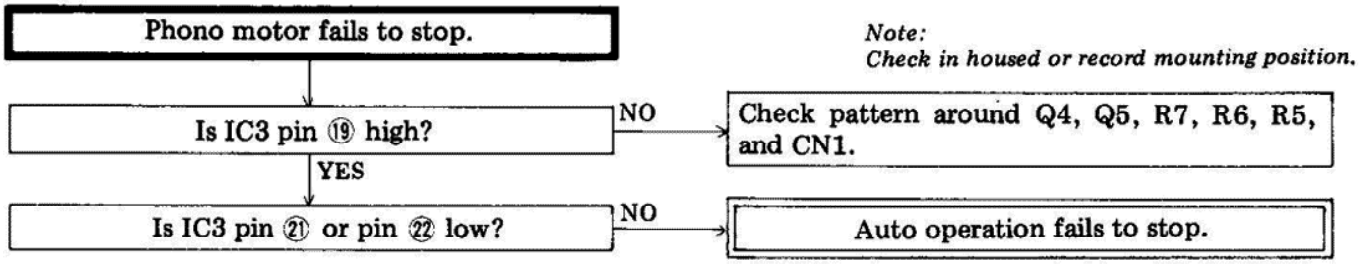
■ **Loading in Failure**



■ Auto Lead-in Failure

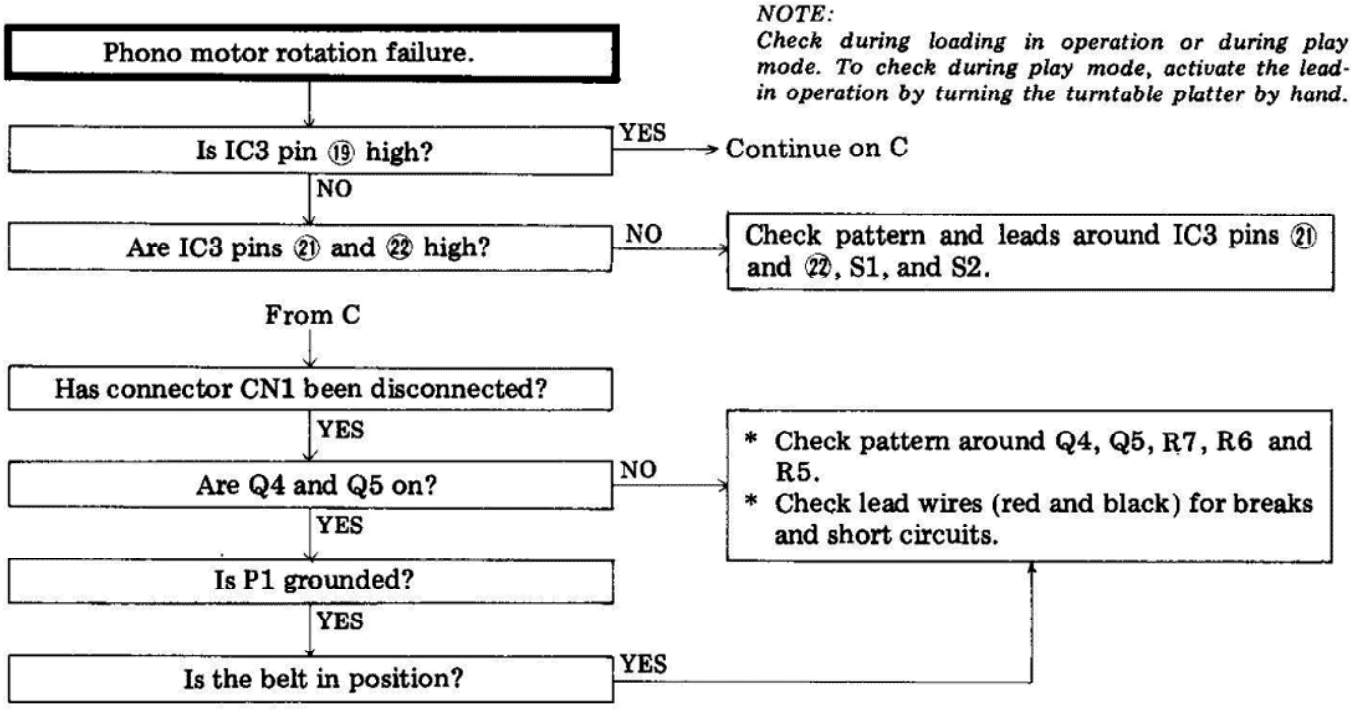


■ Phono Motor Fails to Stop



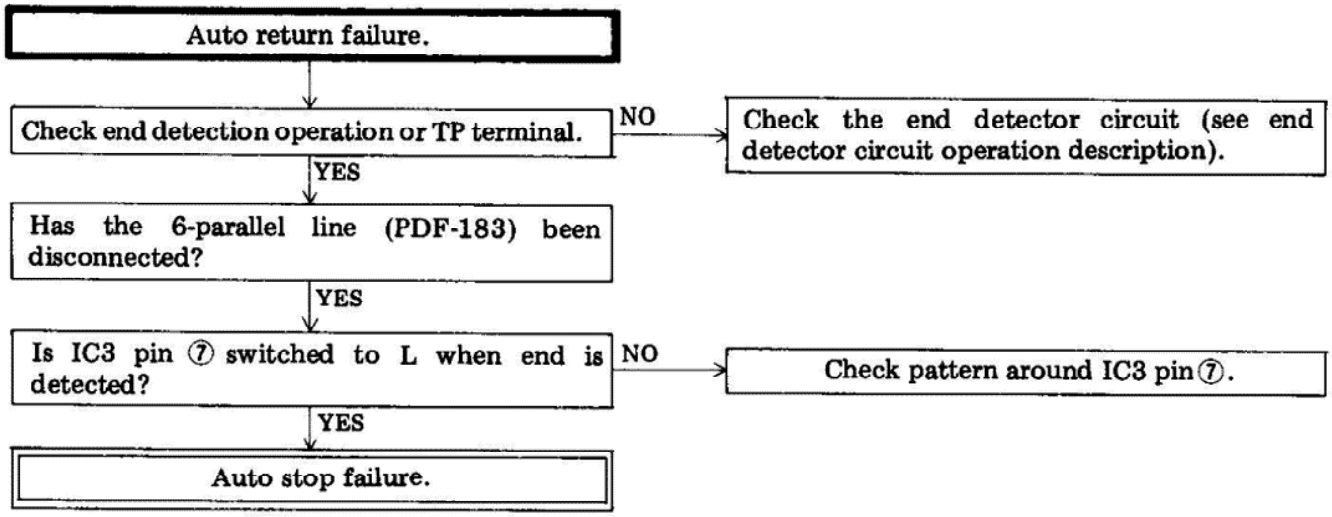
Note:
Check in housed or record mounting position.

■ Phono Motor Rotation Failure

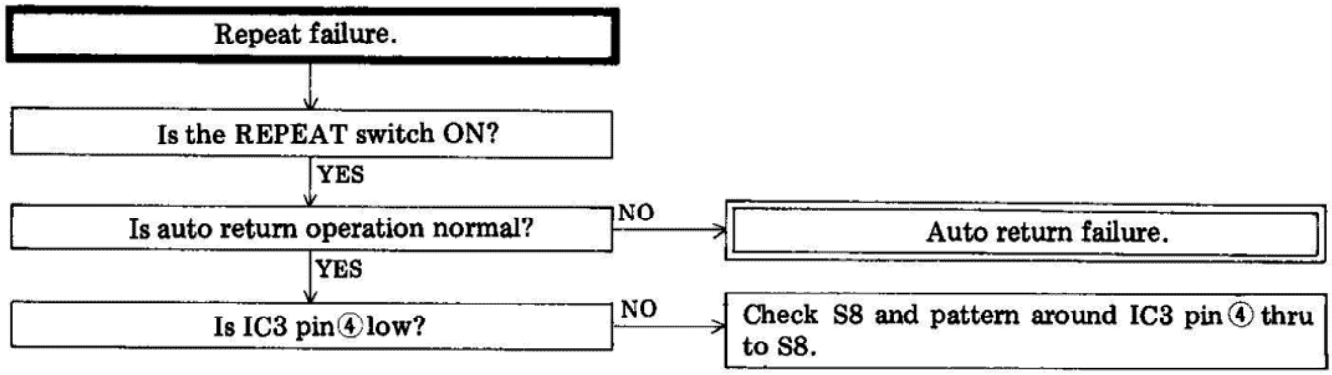


NOTE:
Check during loading in operation or during play mode. To check during play mode, activate the lead-in operation by turning the turntable platter by hand.

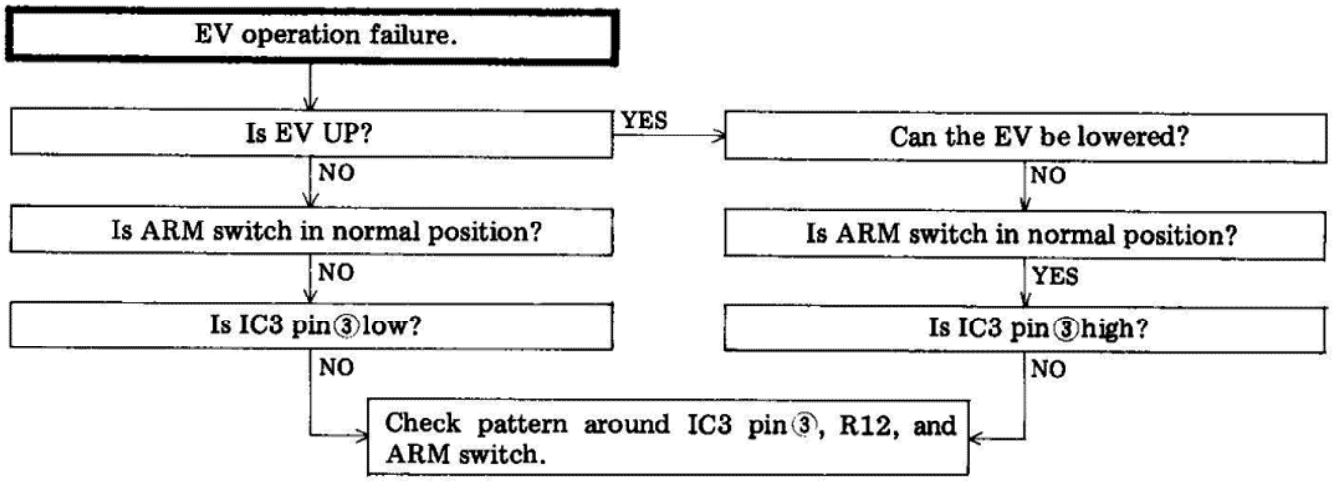
■ Auto Return Failure



■ Repeat Failure

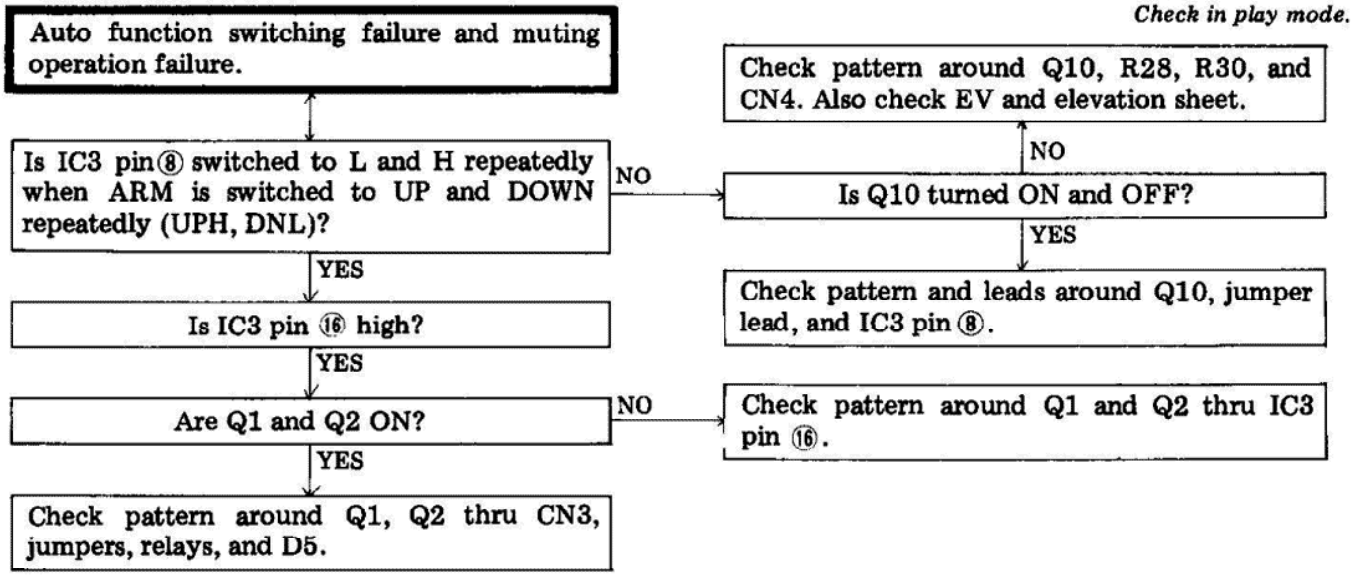


■ EV Operation Failure

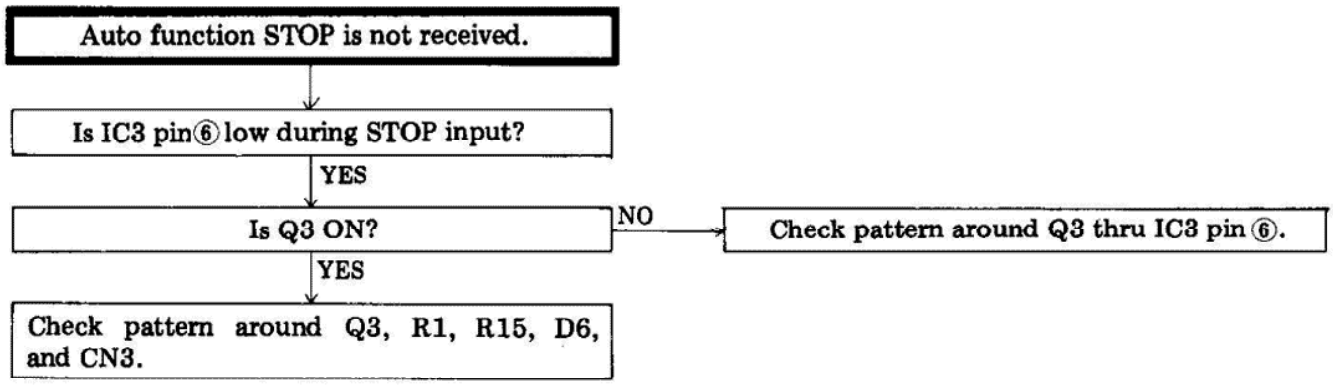


■ Auto Function Switching Failure and Muting Operation Failure

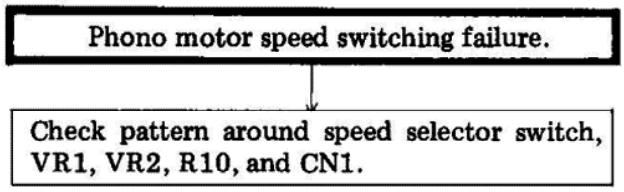
NOTE:
Check in play mode.



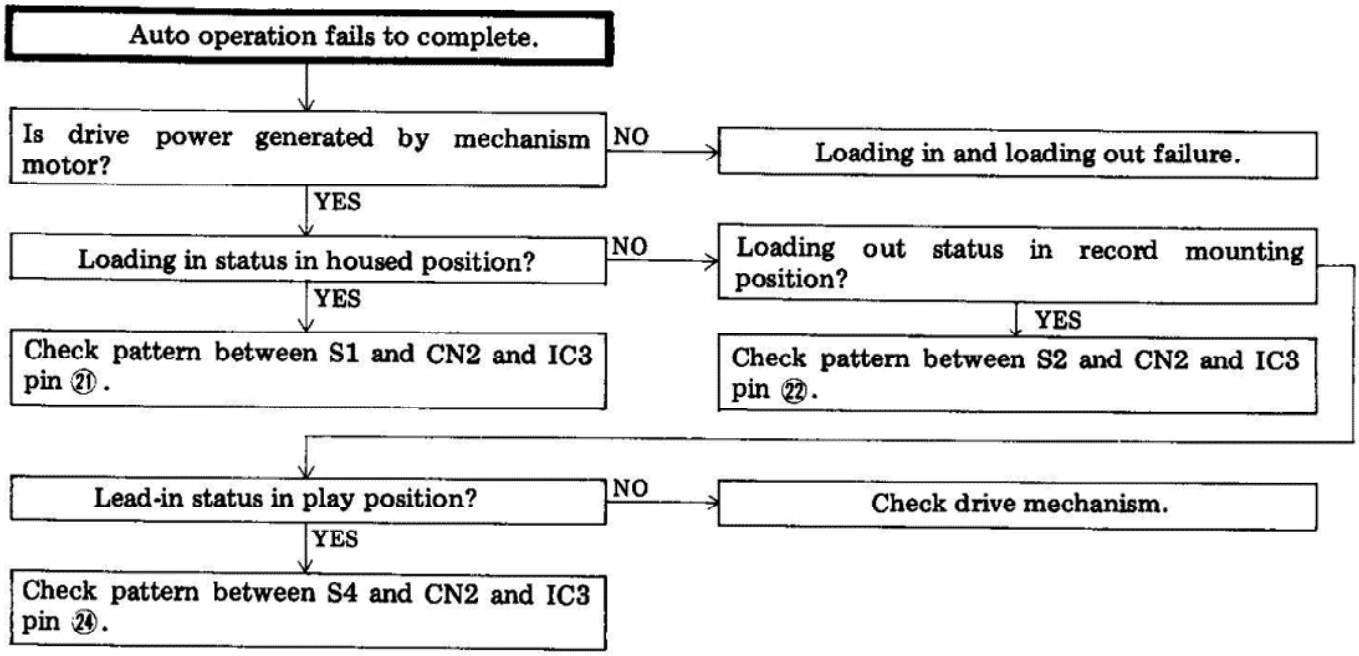
■ Auto Function STOP is Not Received



■ Phono Motor Speed Switching Failure



■ **Auto Operation Fails to Complete**



13.ADJUSTMENTS

13.1 ADJUSTMENT OF STYLUS LOWERING POSITION

If the stylus fails to lower onto the correct position on the record during normal play mode, adjust the position by the following procedure. Take care not to damage stylus or record during this adjustment.

1. Press the START/STOP button to start play mode.
2. Observe the direction and degree of displacement (that is, estimate by how many mm the stylus is displaced from the record lead-in groove).
3. Put the arm elevation switch into the [▼] position.
4. Using a small screwdriver, carefully turn the adjustment screw according to the direction and degree of displacement as indicated below.
   - The stylus lowering position is corrected by about 10mm by half a turn of the adjustment screws.
   - If the displacement is towards the outer edge of the record, turn the adjustment screw clockwise as seen from above.
   - If the displacement is towards the center of the record, turn the adjustment screw counter clockwise as seen from above.
5. Check the adjustment
   After completing the adjustment, gently push the head shell in the direction of the arrow, and check that it stops at the position of the outer lead-in groove of the record (the tonearm moves up to the stopped position during play mode).

Adjustment precautions

- Do not turn the turntable upside down, or tip over by a large degree.
- Do not apply very much pressure when turning the adjustment screw.

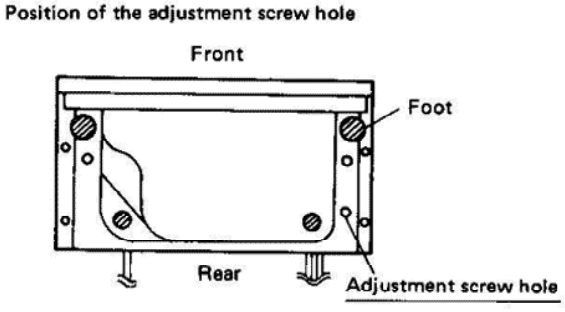


Fig. 13-1 Position of Adjustment Screw Hole

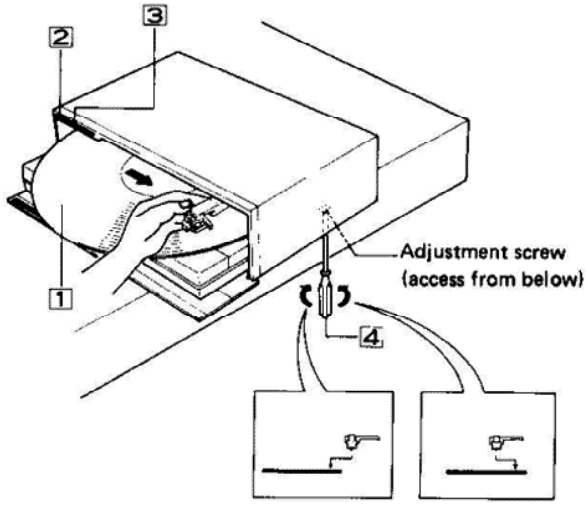


Fig. 13-2 Stylus Lowering Position Adjustment

13. 2 ARM ELEVATION HEIGHT ADJUSTMENT

1. Put the arm elevation into UP position, and loosen the wrench head screw shown in Fig. 13-3. Once this screw has been loosened, the elevation sheet is pushed up to maximum height position by a spring in the elevation shaft.
2. Adjust the elevation sheet so that the stylus tip is 7 ±2 mm above the record surface. (if the height is adjusted too low, there is danger of the stylus tip scraping against the record surface during return operation).
3. Tighten the wrench head screw to fix the elevation sheet height.
4. Check the stylus tip height. If it has changed, repeat the above procedure starting from step 1.

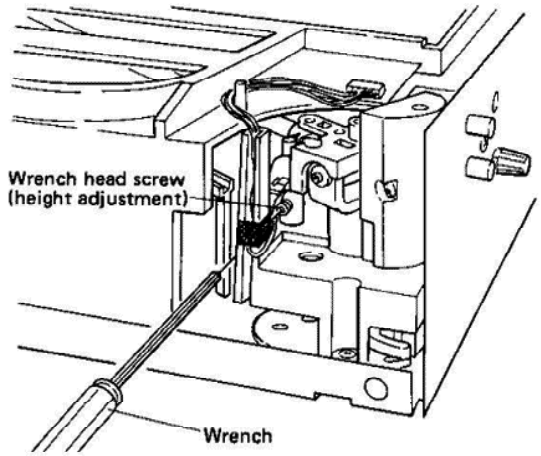


Fig. 13-3 Elevation Arm Height Adjustment

13.3END DETECTOR CIRCUIT ADJUSTMENT

1. Always adjust the stylus lowering position before adjusting the end detector circuit.
   Remove the bonnet from the main turntable cabinet.
2. Put the PL-X7 into play mode, and then switch the power off.
   Also disconnect the circuit board ass'y connector (CN) to prevent movement in the mechanism and phono motors.
3. Connect a DC voltmeter to the TP1 (GND) and TP2 terminals (see Fig. 13-4).
   Then switch the power back on, and move the tonearm so that the stylus is at a position 47.5 mm from the center spindle. Read the voltage at that time in the voltmenter (see Fig. 13-5).
4. Next move the tonearm stylus tip to a position 57.5 mm from the spindle, and adjust VR3 so that the voltage read at this position is 5.8V ±0.2V lower than the voltage read in step 3 above.

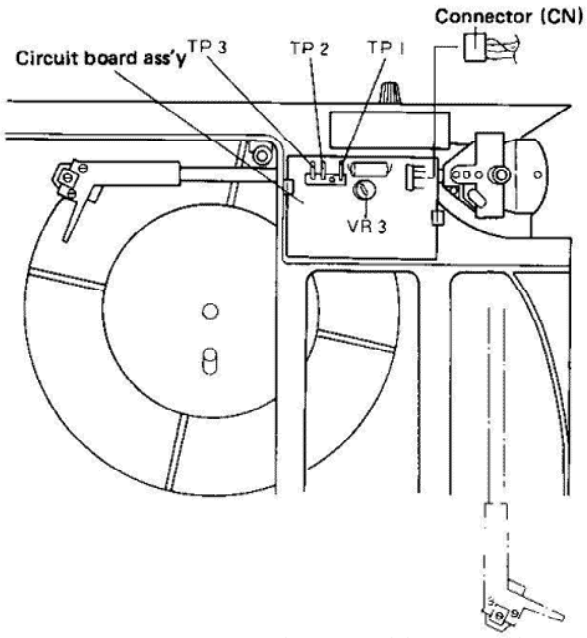


Fig. 13-4 End Detector Adjustment 1

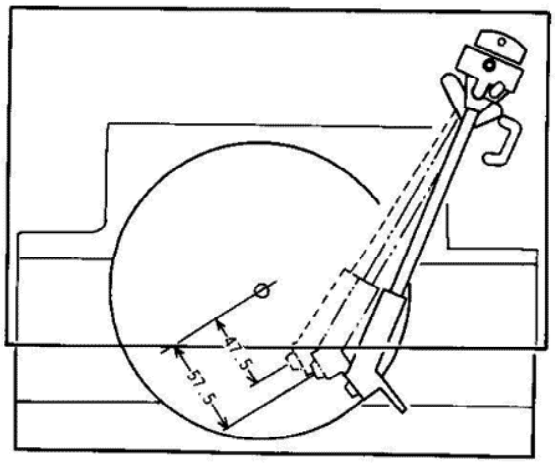


Fig. 13-5 End Detector Adjustment 2

13.4 PHONO MOTOR SPEED ADJUSTMENT

1. Place a strobo scope on the turntable platter, and switch the power on.
2. Adjust the speed adjustment VR from the rear of the PL-X7. Short circuiting of the VR to the rear panel via the screwdriver during this adjustment can result in a change in the speed setting. If using a metallic screwdriver, it is recommended that the shaft of the driver be wound with insulating tape, and that direct contact between driver and rear panel be avoided. (See Fig. 13-6).

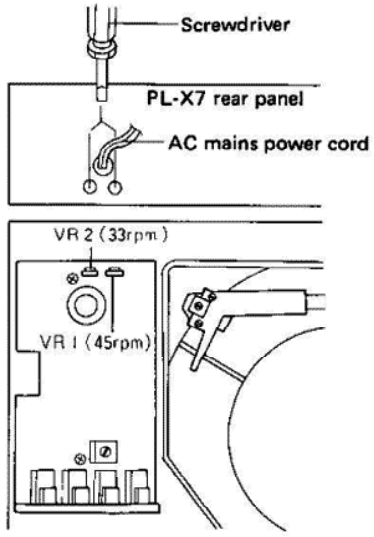


Fig. 13-6 Phono Motor Speed Adjustment

14.FOR S TYPE

PL-X7/S is same as PL-X7/HE with the exception of the following sections.

14.1 SPECIFICATIONS

Miscellaneous

Power Requirements . . . . . AC 110/120/220/240V (switchable), 50, 60Hz

14. 2 PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ *GENERALLY MOVES FASTER THAN* ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Contrast of Miscellaneous Parts

Mark	Symbol & Description	Part No.		Remarks
		PL-X7/HE	PL-X7/S	
	Front panel	PNY-040	PNX-476	
⚠ ★★	Power transformer (220/240V)	PTT-165	. . .	
⚠ ★★	Power transformer (110/120/220/240V)	. . .	PTT-175	
⚠ ★	Power cord	PDG-033	PDG-030 (PDG-043)	
⚠ ★★	Line voltage selector	PSB-013	PSB-014	
	Operating instructions (English/German/French/Italian)	PRE-009	. . .	
	Operating instructions (English/Spanish)	. . .	PRE-010	

14. 3 SCHEMATIC DIAGRAM

POWER SUPPLY CIRCUIT FOR S TYPE